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Dräger medical
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# Field Service Procedure

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# Conversion Kit
# Narkomed 6000 to Narkomed 6400

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# Conversion Kit
# Narkomed 6000 to Narkomed 6400

## INTRODUCTION

The purpose of this Service Procedure is to provide DrägerService Personnel with detailed instructions to convert an existing Narkomed 6000 Anesthesia Machine into a functional Narkomed 6400 Anesthesia Machine.

There are three kit numbers associated with this conversion. Each kit number contains different kit items, depending on the configuration of the existing Narkomed 6000 machine which is being converted.

The kit numbers and associated configurations are as follows:

| Kit Number | Applicable Narkomed 6400 Conversion Configurations |
|---|---|
| 4118146 | 700 Mhz WPU |
| 4118147 | 233 Mhz WPU with Integrated Patient Monitoring (IPM) |
| 4118148 | 233 Mhz without IPM |

Prior to beginning this procedure, ensure that the correct kit is being used by performing the following:

1. Remove the lower back panel of the Narkomed 6000 Series machine.
2. Verify the WPU processor speed by viewing the label located on the WPU.
   a. Does the processor speed list 700 Mhz?

      **NO** - Proceed to step b.
      **YES** - Use kit number 4118146.

   b. Does the processor speed list 233 Mhz and the machine have an IPM installed?

      **NO** - Use kit number 4118148.
      **YES** - Use kit number 4118147.

Once verification of the appropriate kit has been established, proceed with the installation instructions contained within this Service Procedure.

Appendix A of this Service Procedure is provided for your convenience. Appendix A contains a matrix representing all parts contained within each kit. This matrix details quantity, piece part number, and associated kit applicability. Also contained on the matrix is a cross reference between part number and item number as found on the figures within this Service Procedure.

## INSTALLATION PROCEDURES

1. Turn the System Power switch to STANDBY.
2. Remove AC power from the machine and wait approximately 3 minutes for system shut down, as indicated by an extinguished green LED on the Vitalbus HUB, then pull all circuit breakers to their 'out' position.

   **WARNING:** Before servicing, ensure that AC power is removed from the machined and all circuit breakers are disengaged (pulled out). Failure to observe this precaution may cause injury by electrical shock.

   **CAUTION:** Use ESD precautions when handling any of the electronics assemblies. These components contain static sensitive components.
3. Disconnect all pipeline hoses.
4. Close all cylinder valves except for one O2 cylinder.
5. Set the oxygen flow to 5 liters per min.
6. Open the other gas flow control valves to drain pressure from the system.
7. Close the O2 cylinder valve and the O2 flow control valve. Press the O2 Flush valve to drain oxygen pressure from the system then close all flow control valves.
8. Remove all the cylinders from their yokes.
9. Remove and retain the Vitalbus HUB mounting hardware (do not disassemble the hinge hardware). Remove the power cord strain relief retainer and swing open the assembly.
10. Remove the upper panel mounting hardware and remove these panels from the machine. Remove the access panel behind the DISS pipeline connectors.
11. If fitted with an IPM module, disconnect all patient data cables and the Vitalbus cable from this pod then loosen its captive mounting screw and slide the assembly out of the machine. If not fitted with an IPM module, remove the IPM monitor blank panel from the chassis.
12. Disconnect the GAP patient sample line and disconnect the Vitalbus cable from this pod then loosen its captive mounting screw and slide the assembly out of the machine.
13. Disconnect the GAP Vitalbus cable from the Vitalbus HUB then remove this cable from the machine and discard it.
14. Insert the male connector of a 6' Vitalbus cable into the top hole on the right side conduit and fish it out at the bottom and attach it to an available Vitalbus port on the HUB. Route the female end of this cable in to the flowmeter housing.

    **NOTE:** The top conduit hole is very narrow; if the machine is configured with an IPM and/or Strip Chart Recorder, spread out the existing cables vertically then insert the new cable connector between them.
15. Properly package the GAP for return to DMI and place a copy of the Retuned Material Authorization (RMA), that was provided with the upgrade kit's Packing List. If this reference number is unavailable, contact your DMI Customer Service Representative to obtain the reference number that is required for its return to DMI.
16. Remove and retain the seven screws and washers securing the original monitor top cover (1) to the frame chassis. Refer to mounting locations in FIGURE 1.
17. Install and secure the new top cover by reusing the hardware previously removed in step 16.

18. Affix a tip over hazard label (2) to the new cover in the location indicated in FIGURE 1.

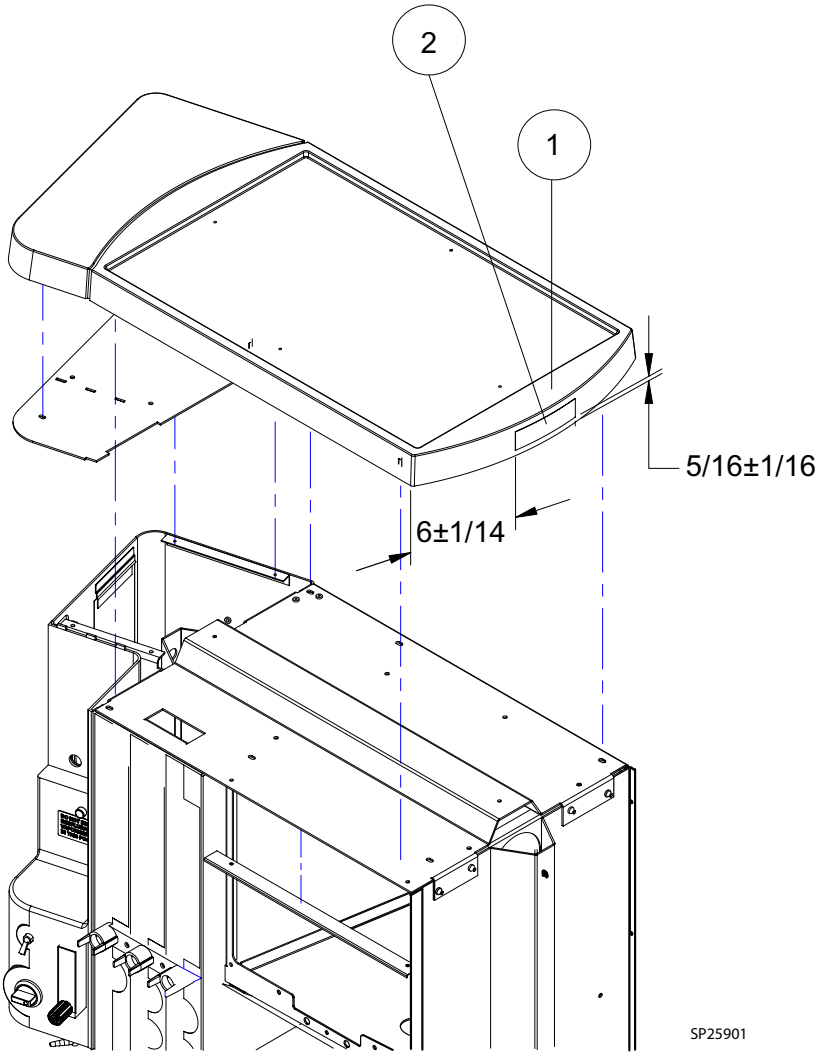


**FIGURE 1. Monitor Top Mounting Locations and Warning Label**

19. Loosen the ferrule fittings and disconnect all copper tubes from the top portion of the flowmeter assembly.
20. Examine the ports on the upper flowmeter assembly as viewed from the rear of the machine. If the port second from the right (1/8" MPT Plug) is plugged, proceed to step 21. Refer to FIGURE 3. If this port is NOT plugged, the upper flowmeter block must be replaced by performing the following steps. Refer to FIGURE 2.
    a. Remove the O2 flow control knob.
    b. Remove the knob guard.
    c. Remove flowmeter shield.
    d. Loosen the retainers and remove flowmeter tubes.
    e. Remove the flowmeter lights and disconnect wire harness.

**INSTALLATION PROCEDURE (continued)**

f. Remove and retain the three ¼" cap screws and lock washers securing the top flowmeter block to the flowmeter channel assembly. Pull the flowmeter light wire harness through the access hole and remove the original top flowmeter block.

g. Remove the flowmeter retainers and gaskets from the original top block, then discard this block. Apply a minimal amount of Dow Corning - High Vacuum Grease (P/N 4105908) to retainer O-rings, the install them into the new top flowmeter block.

h. Fish the flowmeter lights wiring harness through the new flowmeter block assembly and secure it by reusing the hardware previously removed in step f.

i. Reinstall the flowmeter tubes. Refer to the Flowmeter Replacement portion of Section 4 of the Narkomed 6000 Series Technical Service Manual for detailed instructions.

j. Reattach the wire harnesses to the flowmeter lights with the black wire oriented closest to PCB surface. Straddle the wire harnesses around the top standoff then reinstall the flowmeter light onto the flowmeter channel.

k. Slide the top edge of the flowmeter shield under the retaining lip and reinstall the knob guard with the large access hole to the right.

l. Reinstall the O2 flow control knob. Refer to the Flow Control Valves Replacement portion of Section 4 in the Narkomed 6000 Series Service Manual for detailed knob stop adjustment instructions.

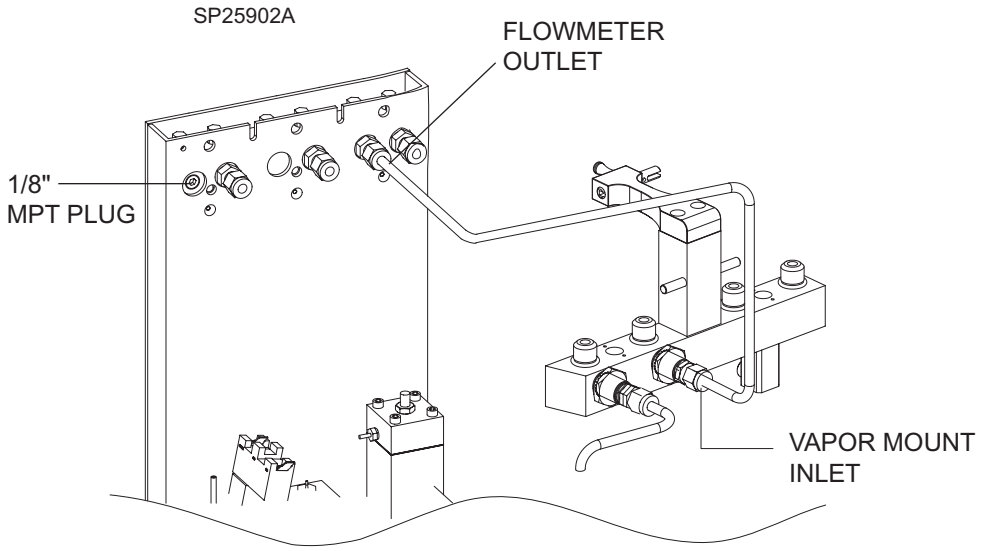


**FIGURE 2. Old Style Flowmeter Outlet**

21. Loosen the ferrule fitting of the copper tube (8) at the Vapor mount inlet, then remove and discard it. Refer to FIGURE 3.

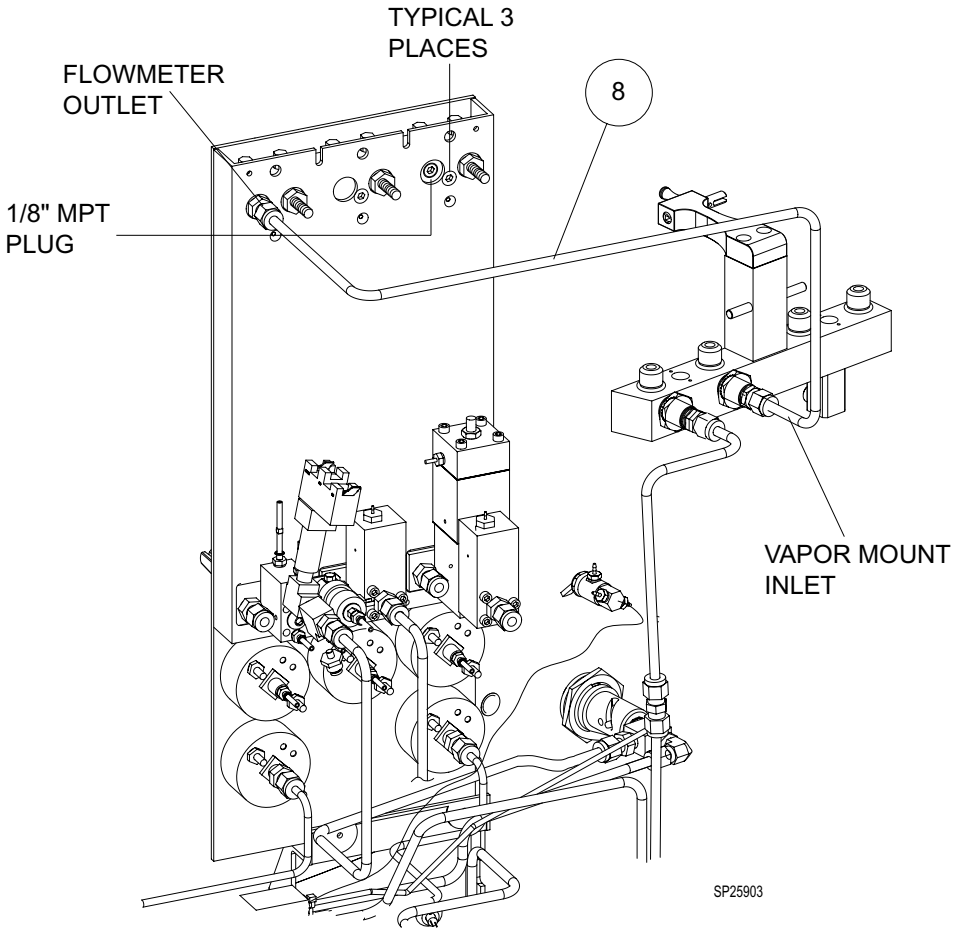


**FIGURE 3. New Style Flowmeter Outlet**

22. Remove and retain the hardware securing the Air OFPD (21) and take care not to dislodge the sealing O-ring. Refer to FIGURE 4.

**INSTALLATION PROCEDURE (continued)**

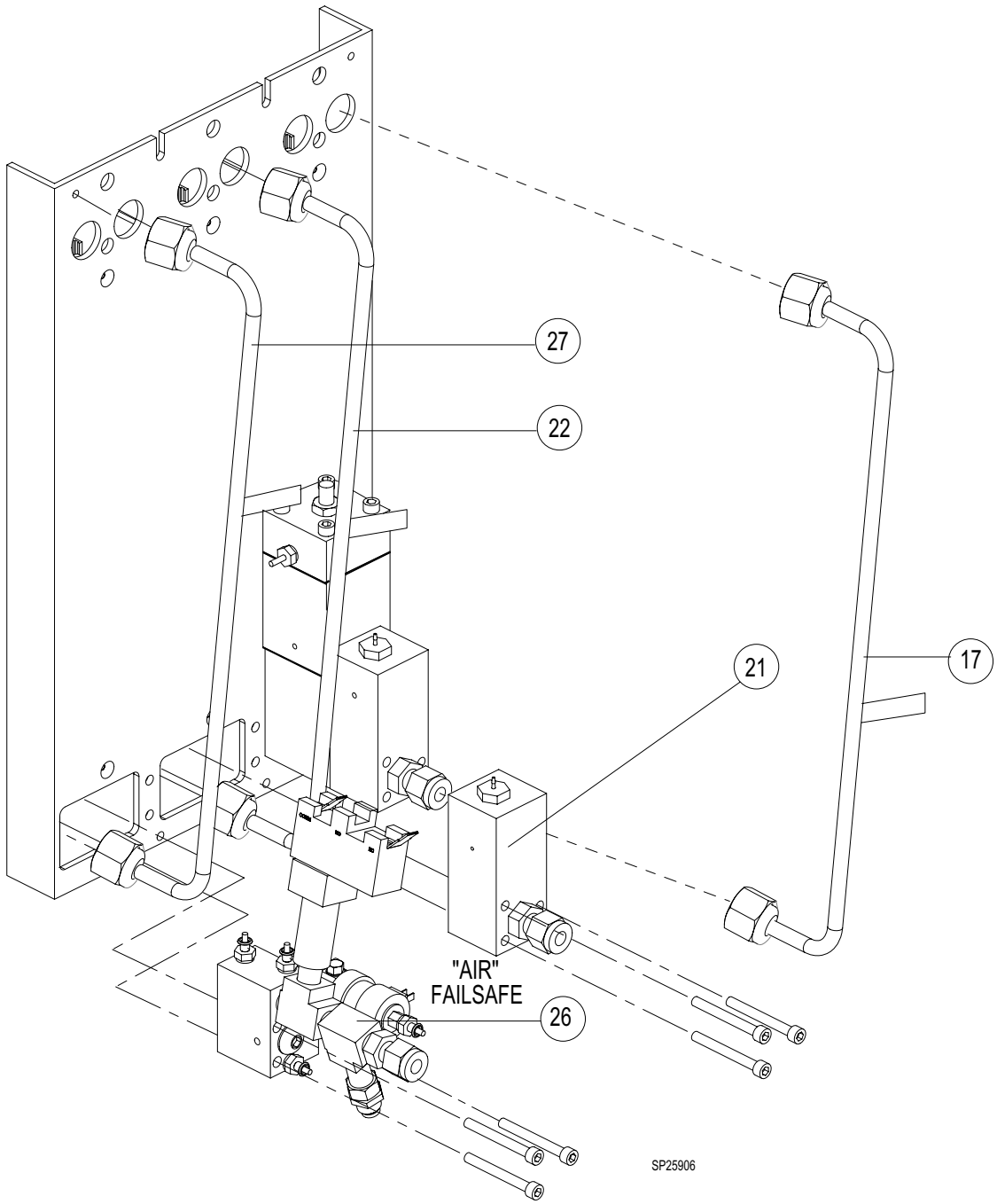


**FIGURE 4. Original Lower Flowmeter Component Identification**

23. Remove and retain the hardware securing the O2 solenoid manifold (26), taking care not to dislodge the three sealing O-rings.

24. Loosen the ferrule fittings that disconnect the N2O, AIR, and O2 flowmeter crossover copper tubes (17, 22, 27) from the lower flowmeter assembly and discard these tubes.
25. Orient custom bent copper tube (39) as shown in FIGURE 5. Fish the tube through the access hole and secure this connection at the upper left port of the flowmeter bank.

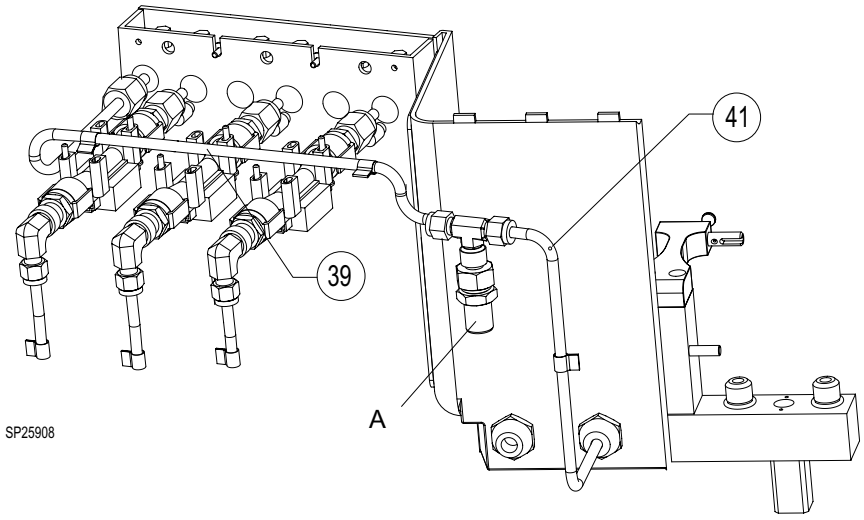


**FIGURE 5. Relief Valve Connectors**

26. Orient the custom bent copper tube (41) with the short end connected at the vapor mount as shown in FIGURE 5.
27. Attach the relief valve assembly (A) between the copper tubes with the valve oriented down and away from the IPM pod channel. Tighten the copper tube connections at the valve and vapor mount.
28. Align the straight fittings of the fresh gas flow box assembly (42) with the corresponding ports at the top of the flowmeter block assembly as shown in FIGURE 6. and carefully tighten the three ferrule fittings.

**INSTALLATION PROCEDURE (continued)**

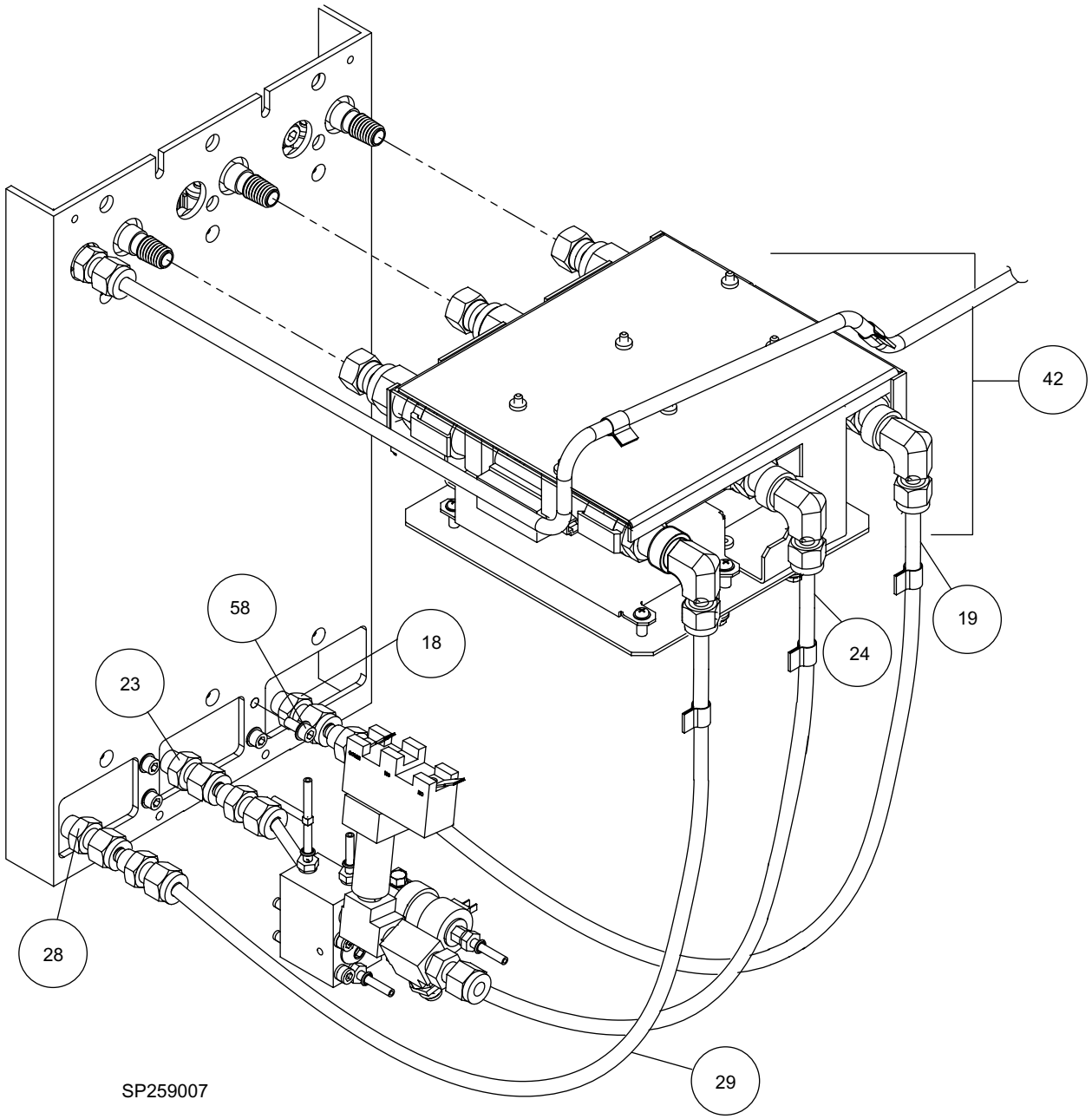


**FIGURE 6. Electronic Flow Box Connection**

29. Install the lower cover (55) with the studs facing towards the rear. Secure the lower cover with 6-32 x 1/4 Phillips screws (56), and #6 lock washers (57). Refer to FIGURE 7.

30. Remove and discard the upper cap screw (58) and retain the lock washer nestled between the Air and N2O OFPD. Refer to FIGURE 6.

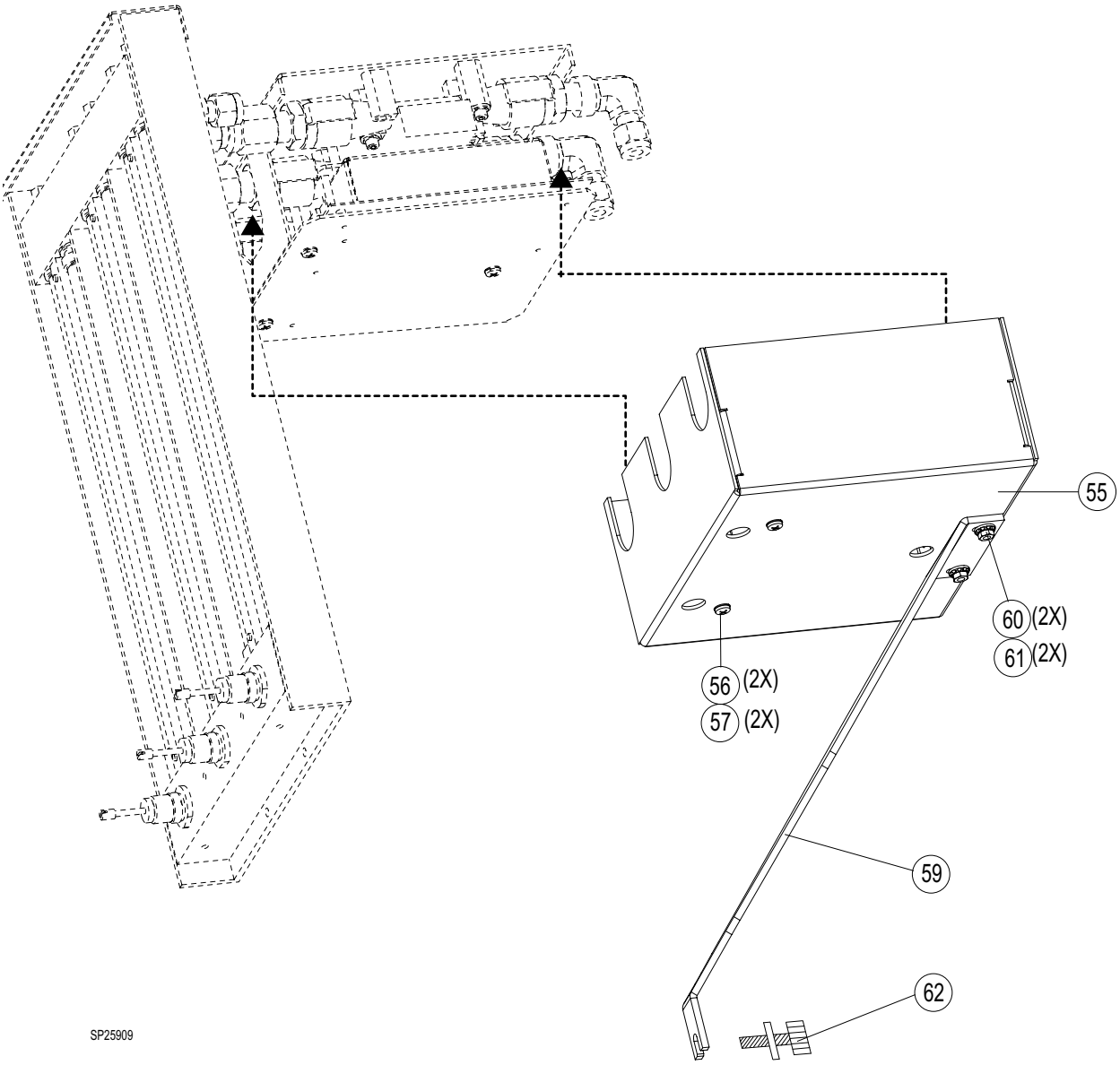


**FIGURE 7. Lower Cover Installation**

31. Install the support brace (59) onto the studs of the lower cover and secure it with #6 flat washers (60) and 6-32 kep nuts (61). Secure the bottom of the support brace with an 8-32 x 1/2 cap screw (62) and previously removed lock washer in the hole between the Air and N2O OFPD. Refer to FIGURE 5. and FIGURE 6.
32. Attach the N2O poly tube (19) to the N2O port (18) on the lower portion of the flowmeter assembly and tighten the ferrule fitting. Refer to FIGURE 6.

**INSTALLATION PROCEDURE (continued)**

33. Attach the AIR poly tube (24) to the N2O port (23) on the lower portion of the flowmeter assembly and tighten the ferrule fitting.
34. Attach the O2 poly tube (29) to the N2O port (28) on the lower portion of the flowmeter assembly and tighten the ferrule fitting.
35. Verify the O2 solenoid manifold (26) sealing O-rings are still in their recessed grooves, then secure the assembly by reusing the hardware previously removed in step 23. Refer to FIGURE 4.
36. Verify the Air OFPD (21) sealing O-ring is still in its recessed groove, then secure the assembly by reusing the hardware previously removed in step 22.
37. Attach one end of the gas measurement wire harness (63) to the gas measurement PCB. Fish the wire harness down through the right side conduit. Connect the other end of this wire harness to the VPO PCB at junction J5/GILL 2. Refer to FIGURE 8. and FIGURE 9.

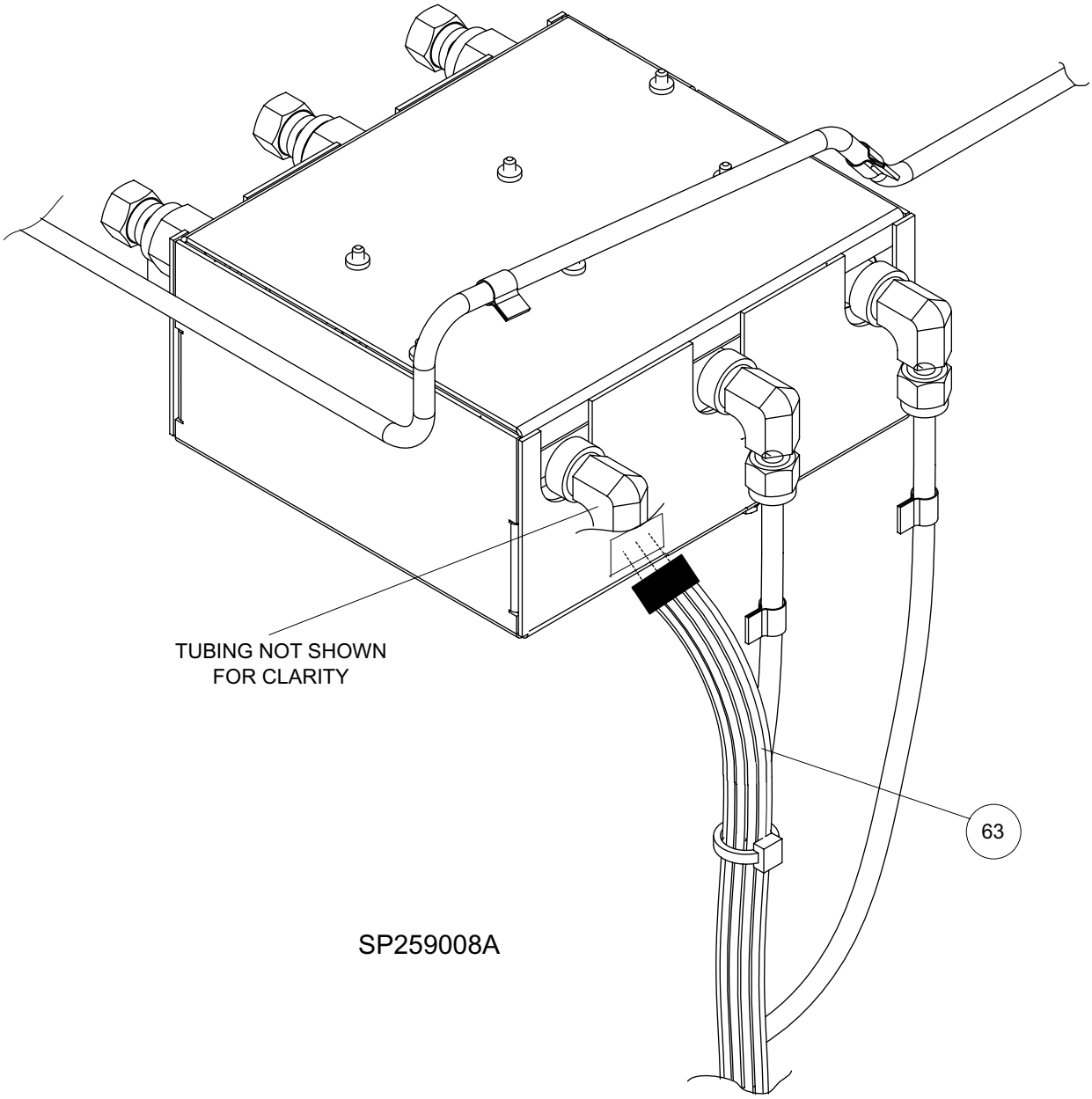


**FIGURE 8. Gas Measurement PCB**

**INSTALLATION PROCEDURE (continued)**

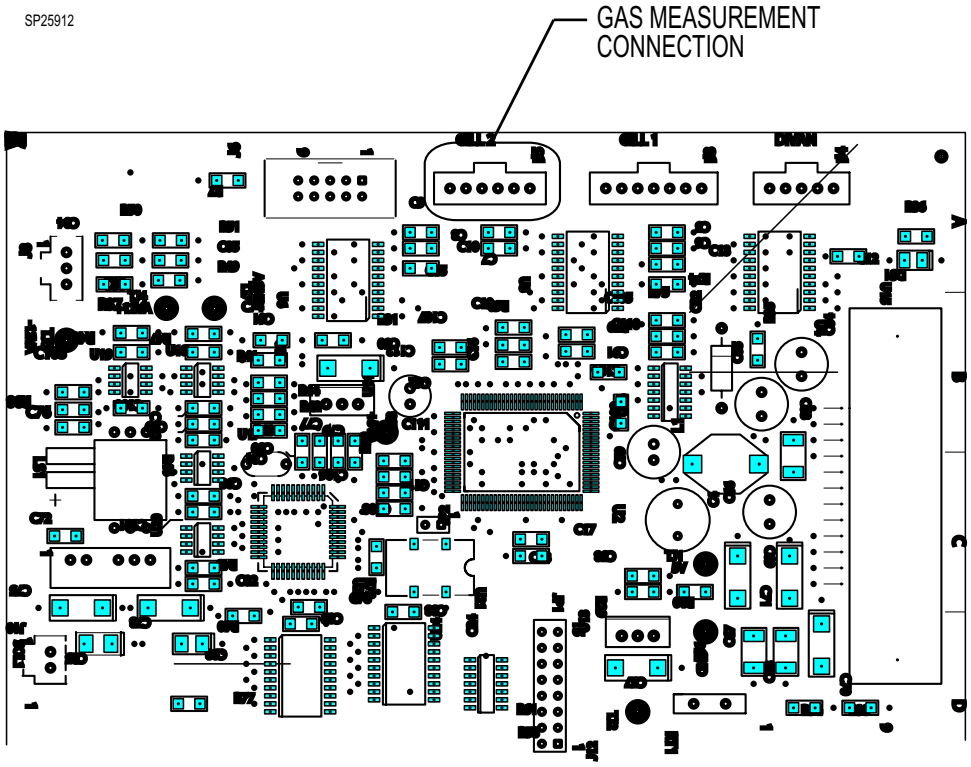


**FIGURE 9. VPO Gas Measurement Connection**

## WPU UPGRADE (If Applicable)

**CAUTION:** Version 4.02 Software requires at least a 233 MHz Processor and 64 Meg RAM to operate properly. If the machine is configured with an IPM pod the 4.02 Software requires 128 Meg RAM. Failure to comply with these precautions may result in a WPU or related system failure.

38. Identify the amount of RAM and Processor speed. Record the WPU S/N indicated by the WPU cover label. Refer to the table in FIGURE 10. to determine if a RAM and/or processor modification is required, and if so, then follow the instructions for installing the RAM and/or processor modifications.

| WPU Configuration | RAM/Processor Modifications Required |
|---|---|
| 233 MHz Processor, 64 Meg RAM, No IPM | No RAM or Processor modification required. Skip to Keylok Installation Warning at step 83. |
| 233 MHz Processor, 32 Meg RAM, No IPM | Update to 64 Meg RAM. Continue with step 67. |
| 233 MHz Processor, 32 Meg RAM, w/IPM | Update to 128 Meg RAM. Continue with step 67. |
| 700 MHz Processor, 64 Meg RAM | Update to 128 Meg RAM. Skip to step 76. |
| 166 MHz Processor, 32 Meg RAM, No IPM | Update to 64 Meg RAM and Processor to 233 MHz. Continue with step 39. |

**FIGURE 10. RAM Configuration**

## Processor 166 MHz w/32 Meg Ram Conversion to 233 MHz w/64 Meg RAM

39. Disconnect all cables from the power supply assembly and move them out of the way.
40. Disconnect all of the cables except for the DC power cable, from the right side (facing the rear of the machine) of the WPU.
41. Using a screw driver with a 10” shaft, loosen the four captive mounting screws securing the WPU to the machine. Pull the WPU straight back then pivot it counterclockwise to allow its removal out of the machine.
42. Remove the WPU cover.
43. Remove the WPU power filter mounting bracket from the WPU chassis.
44. Remove the hardware securing the WPU Power Supply. There are four screws and lock washers mounted externally near the WPU Power Supply fan and one screw, lock washer internally at the chassis. Lay the WPU Power Supply onto the top corner of the WPU chassis and away from the CPU fan.

**INSTALLATION PROCEDURE (continued)**

45. Unlatch the CPU Fan retaining clip by first pushing it down a bit to relieve the pressure then move the hook out to clear the retaining wings on the IC socket. See FIGURE 11.

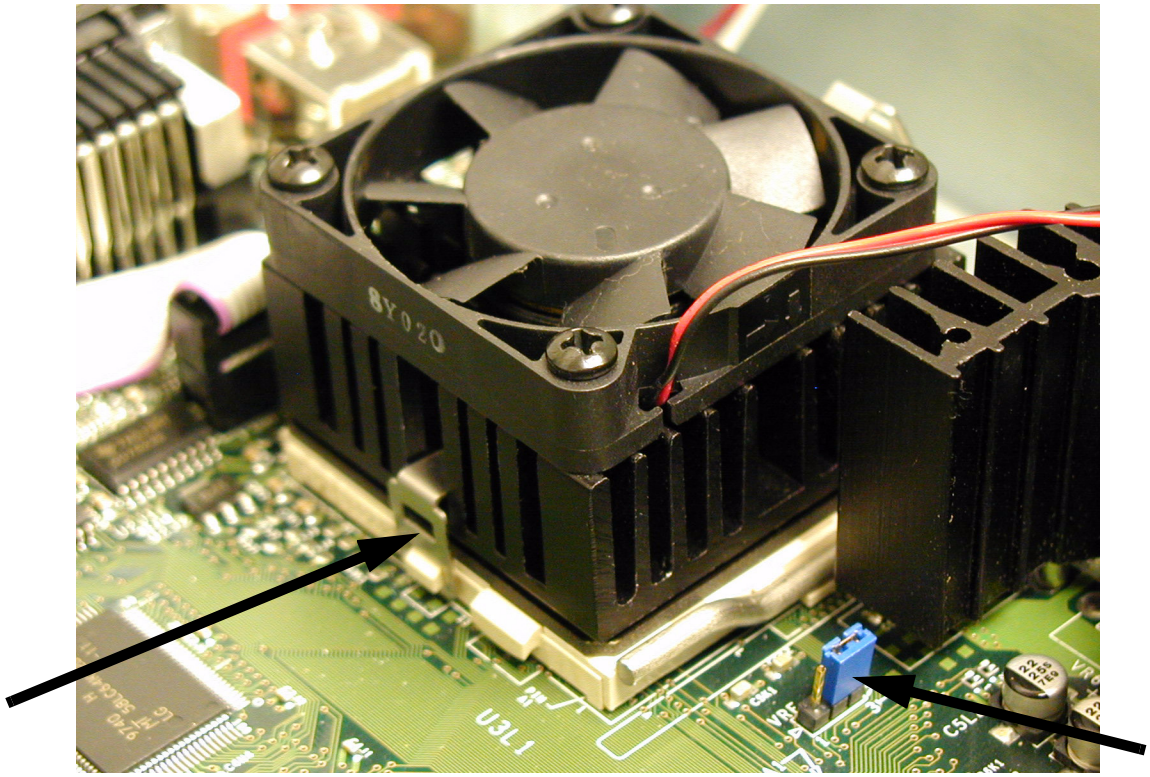

**FIGURE 11. CPU Fan Detail & Jumper J5K1 Pin Configuration**

46. Unlatch the CPU retaining lever and rotate it to the 12:00 position. Remove the processor from the Motherboard.
47. Pry the processor from the CPU fan and discard it then clean off all heat sink compound residues from the CPU fan.
48. Orient the 233 processor with its reference triangle pointed towards the Parallel port. Insert the 233 processor pins into the Motherboard socket and secure it by rotating the retaining lever towards the socket frame and lock it into place.
49. Apply a thin coating of heat sink compound (P/N 4118249) approximately 3/8” in diameter to the center area of the CPU.
50. Orient the CPU Fan with the power cable routed towards the hard drive. Slide the retaining clip hook under the retaining wing on one side and secure it by pushing down on the lever on the other side and hook it onto the wing on the IC socket.
51. Locate junction J5K1 on the Motherboard PCB located near the CPU fan and configure the jumper across pins 2-3.
52. Route the Power Supply filter and power cable through the WPU chassis opening then mount the Power Supply to the chassis by reusing the four screws and lock washers mounted externally near the WPU Power Supply fan and one screw, lock washer internally at the chassis.
53. Secure the WPU power filter mounting bracket to the side of the WPU chassis.

54. Locate junction J9A1 on the Motherboard PCB located behind the ISO-COMM PCB and verify the jumper is configured across pin 1-2. See FIGURE 12.

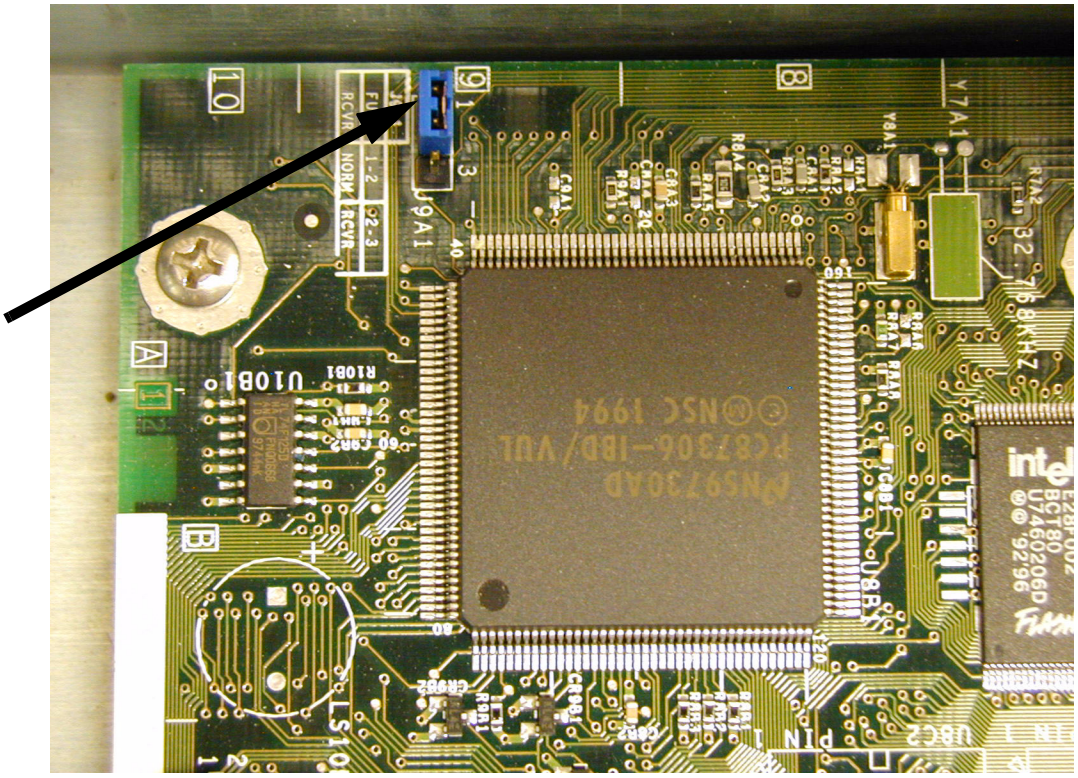


**FIGURE 12. Jumper J9A1 Pin Configuration**

55. If jumper J9A1 configuration is correct skip to next step. Otherwise remove the hardware securing the ISO-COMM PCB card stake to the WPU chassis then carefully lift the PCB evenly out from its motherboard socket. Reconfigure jumper across pin 1-2. Align the ISO-COMM PCB with its expansion PCB track (second from the corner) then carefully and evenly reinstall into the Motherboard socket and ensure that the two COMM cables on this PCB are fully seated into their connectors. Secure the PCB by reusing the hardware previously removed.

56. Locate junction J10C1 on Motherboard PCB located near the 3 volt battery refer to FIGURE 13. and configure the jumpers as follows:

Block A: 1-2, 5-6
Block B: 1-2
Block C: 1-2, 5-6
Block D: 1-2, 4-5

**INSTALLATION PROCEDURE (continued)**

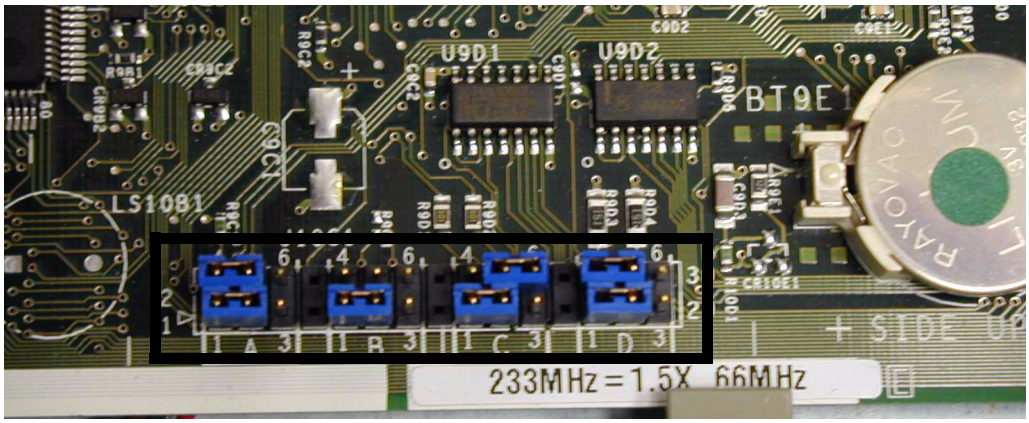


**FIGURE 13. Jumper J10C1 Pin Configuration**

57. Locate the RAM modules. See FIGURE 15.
58. Un-clip the RAM module motherboard retaining clips. Remove and discard all RAM PCB's.
59. Install the RAM modules provided in the kit. If only two modules are being installed they shall be installed closest to the hard drive assembly. The round section of the clip shall be snapped into place on the component (right) side of the RAM module to make proper connection. Verify all RAM modules are perpendicular to the motherboard and the retaining clips at each end of the modules are properly secure. The arrow in FIGURE 16. shows an example of an un-clipped memory module.
60. Reinstall the WPU cover.
61. Apply a new 233 MHz label over the processor section of the WPU cover label.
62. Apply a new Meg label over the RAM section of the WPU cover label.
63. Slide the WPU back into place and secure it with the captive mounting screws.
64. Reattach all WPU cables that were previously disconnected. Refer to FIGURE 14.

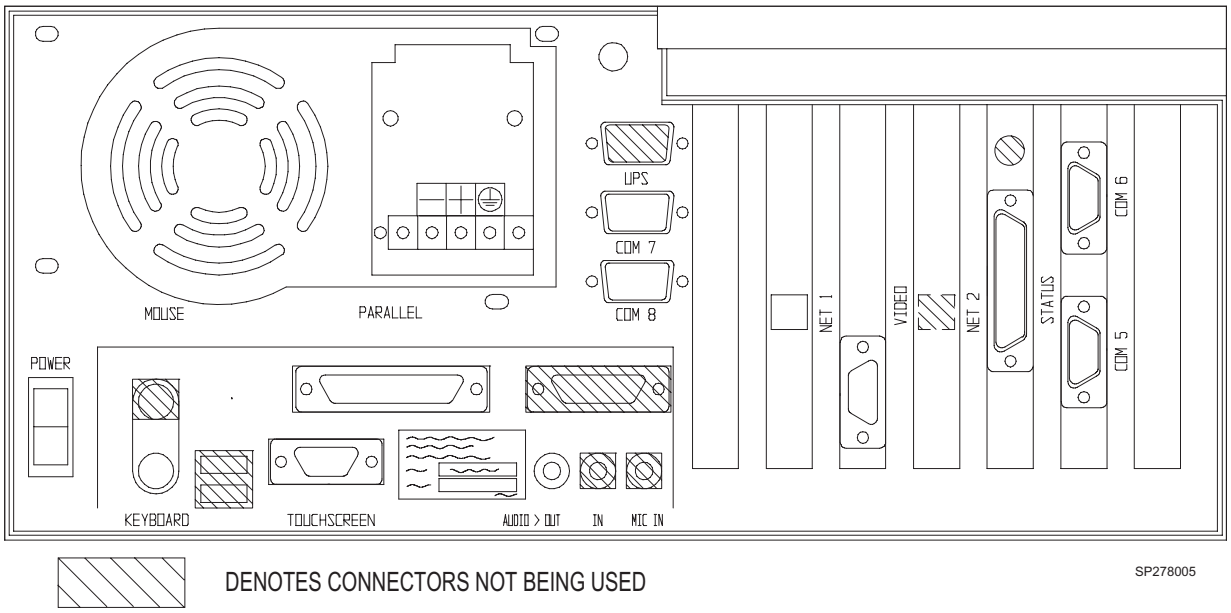


**FIGURE 14. WPU Connector Locations**

65. Secure the cables previously removed from the system power supply assembly.
66. Skip to Keylok Installation WARNING at step 83.

## 233 Mhz PROCESSOR, 32 Meg RAM, NO IPM OR 233 Mhz PROCESSOR, 32 Meg RAM W/ IPM

67. Remove the row of power supply cables closest to the WPU assembly.
68. Remove the WPU cover.
69. Locate the RAM modules. See FIGURE 15.

**INSTALLATION PROCEDURE (continued)**

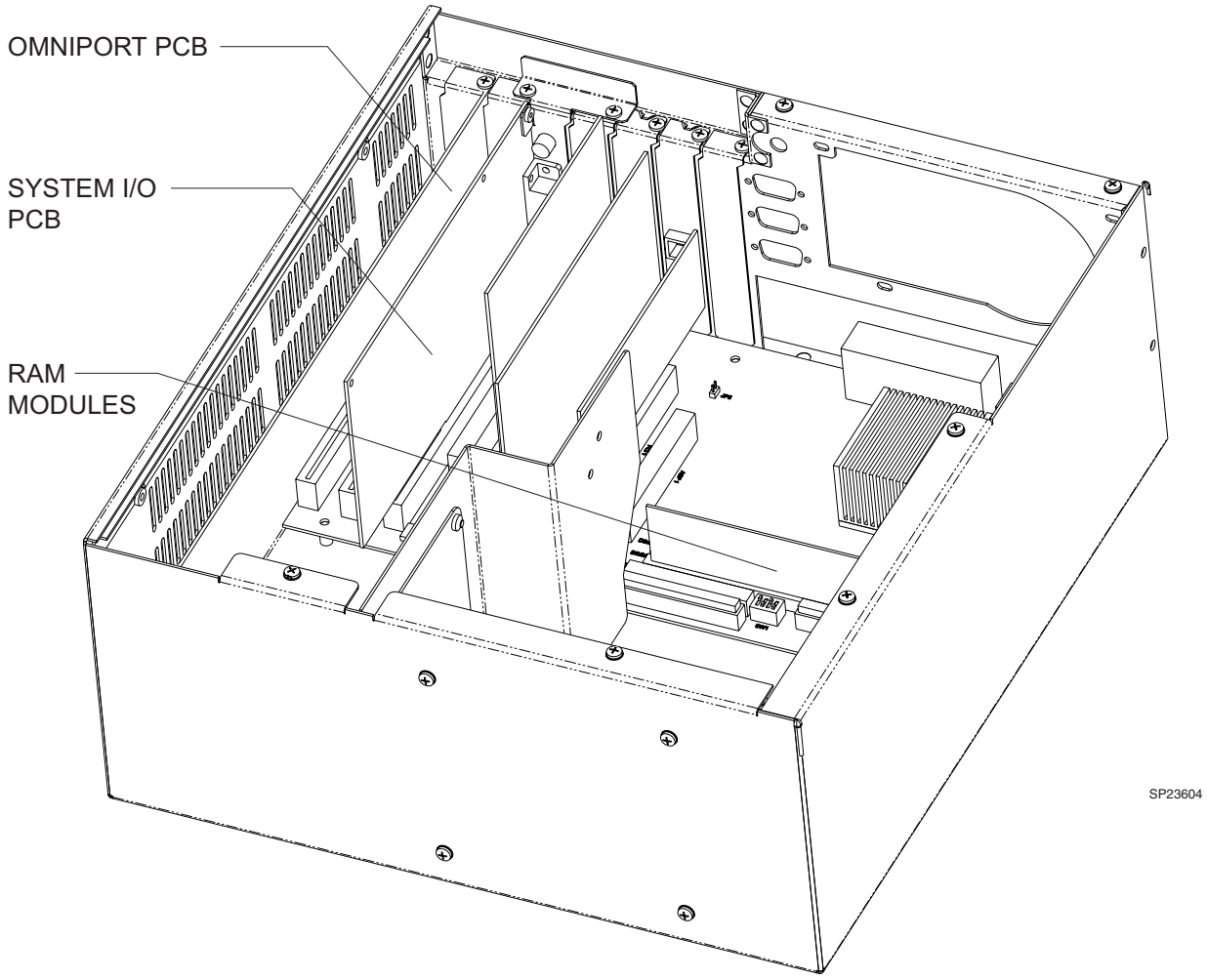


**FIGURE 15. RAM Module Location 233 Mhz Processor**

70. Un-clip the RAM module motherboard retaining clips. Remove and discard all RAM PCB's.
71. Install the RAM modules provided in the kit. If only two modules are being installed they shall be installed closest to the hard drive assembly. The round section of the clip shall be snapped into place on the component (right) side of the RAM module to make proper connection. Verify all RAM modules are perpendicular to the motherboard and the retaining clips at each end of the modules are properly secure. The arrow in FIGURE 16. shows an example of an un-clipped memory module.

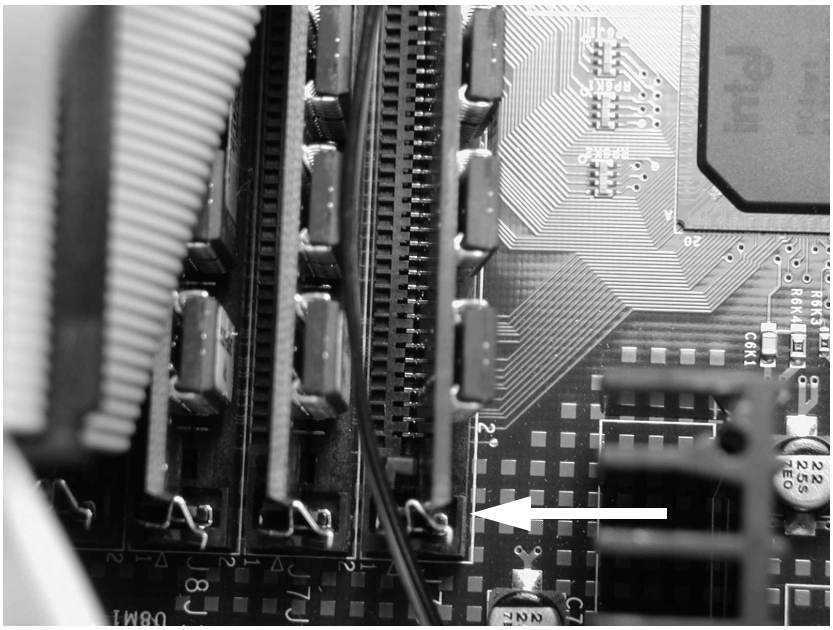

**FIGURE 16. Example of Improperly Clipped RAM**

72. Reinstall the WPU cover.
73. Apply a new Meg label over the RAM section of the WPU cover label.
74. Reconnect and secure the cables previously removed from the power supply assembly.
75. Skip to Keylok Installation Warning at step 83.

### 700 Mhz PROCESSOR, 64 Meg RAM

76. Remove power supply cables.
77. Remove the WPU cover.
78. Locate the RAM modules. See FIGURE 17.

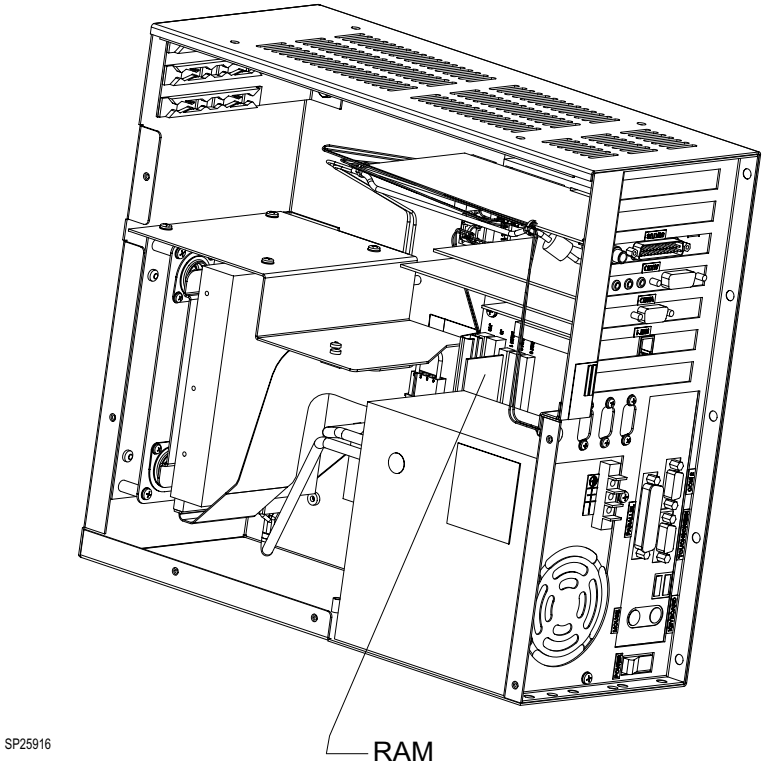


**FIGURE 17. RAM Module Location 700 Mhz Processor**

79. Release the center motherboard RAM retaining clips.
80. Unclip the original RAM module and relocate it to the center position on the motherboard. Ensure that it is seated vertically and horizontally in its socket, then apply firm, even pressure until the retaining clips snap into place. Verify that it is properly clipped in place by gently pulling and making sure it does not retract from the motherboard. Install the additional RAM Module in the same manner.
81. Reinstall the WPU cover.
82. Apply a new Meg label over the RAM section of the WPU cover label.
83. Reconnect and secure the cables previously removed from the power supply assembly.

## KEYLOK INSTALLATION

**WARNING:** The 'Air Only Mode' software option requires the machine to be configured with an Air yoke assembly and fitted with an Air cylinder containing at least 1000 psi.

84. Locate the WPU parallel printer port. If the port has a previously installed Keylok assembly, remove and examine it. If the keylok was configured with “Air Only Mode” as identified by P/N 4116920-002, 4116920-003, or 4116920-005, contact DMI Customer Service to obtain an RMA for its return along with Keylok 4116920-008 that was provided in this kit. In its place, order P/N 4116920-009 Keylok Asm – TEMP/SOUNDS/TREND/AIR/4.0, at no charge. Install the correctly configured Keylok in the WPU parallel printer port and secure it using a small slotted screwdriver. See FIGURE 18.

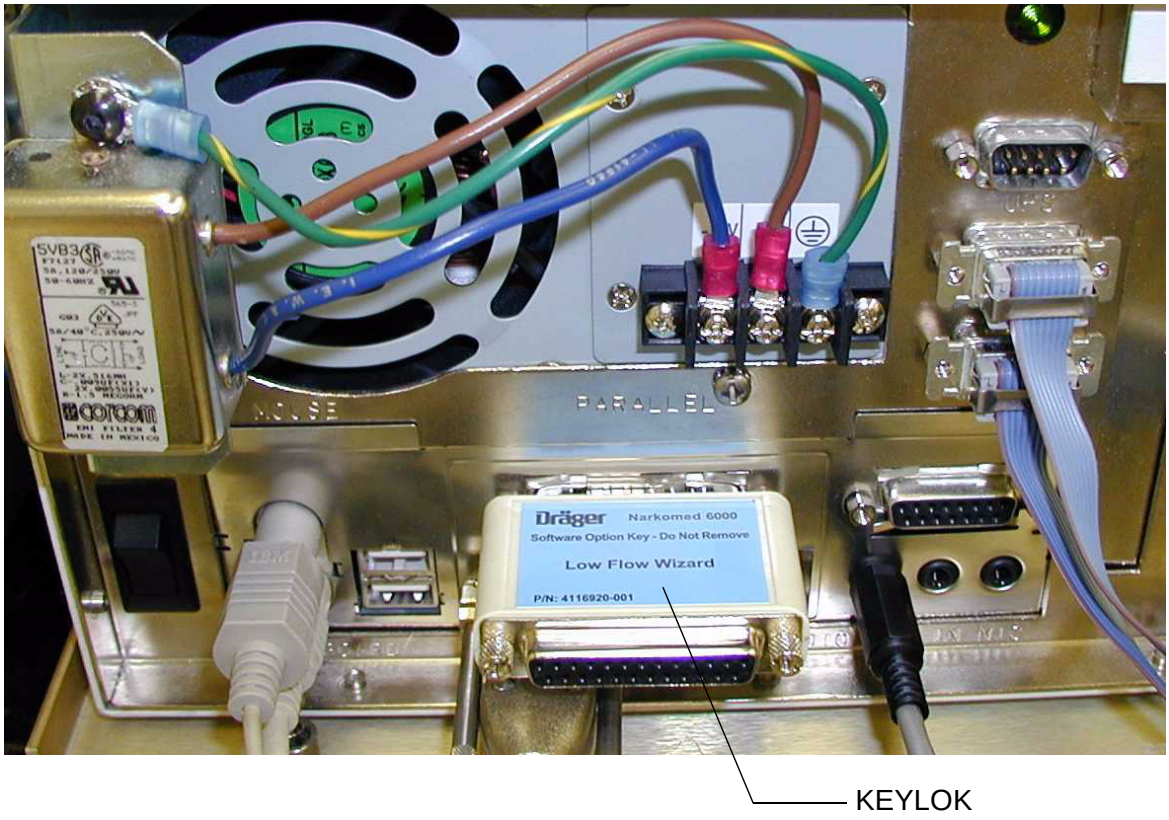


**FIGURE 18. Location of Typical Keylok**

85. If fitted with an IPM module, slide the assembly into its housing and tighten its captive mounting screw. Reconnect the Vitalbus cable to this pod and attach all patient data cables. If not fitted with an IPM module, install the IPM monitor blank panel.
86. Slide the GAP2 module into its housing and tighten its captive mounting screw. Reconnect the Vitalbus cable and install a new semi-permeable tube and new patient sample line provided in the kit.
87. Reinstall all back panels onto the machine.

**INSTALLATION PROCEDURE (continued)**

88. Swing the Vitalbus Hub door closed. Reattach the power cord strain relief retainer and reinstall the hardware that was previously removed in step 9. Route the power cord's strain relief with a loop in a clockwise direction. The retaining clamp shall be located 17 inches (5¼ in. diameter) from the cord end and secured to the Vitalbus Hub door using the mounting hole directly above the power cord socket. Refer to FIGURE 19. for proper location.

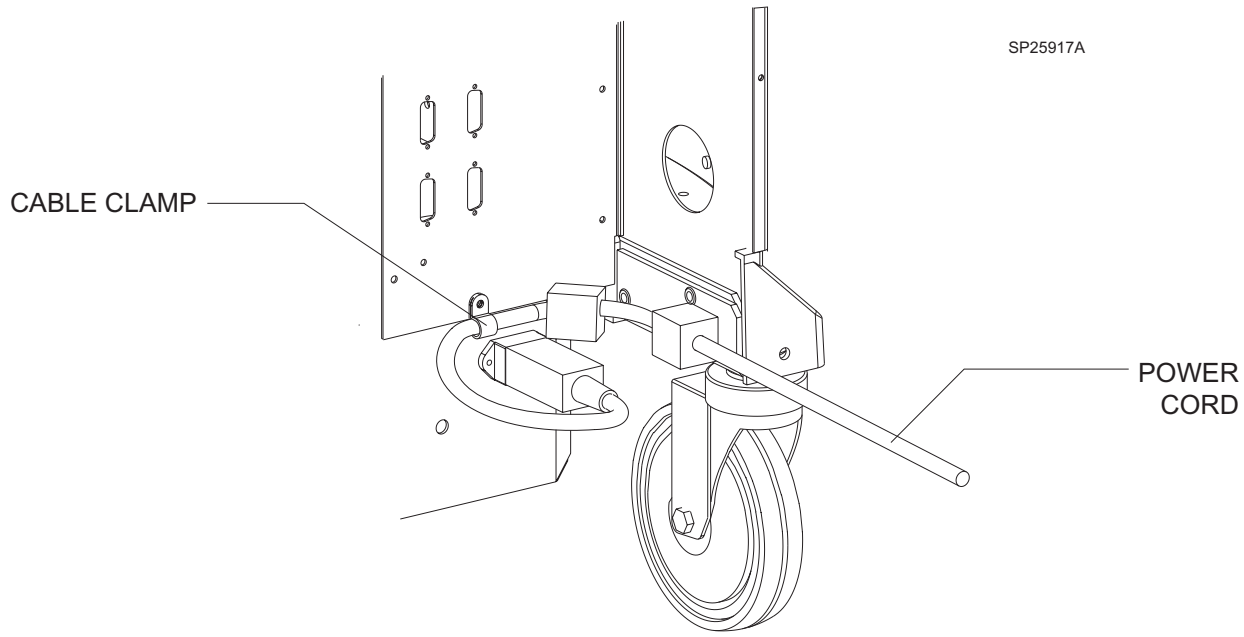


**FIGURE 19. Vitalbus Hub Power Cord Routing and Clamping Location**

89. Reinstall the cylinders in their yokes. Restore AC power to the machine and enable the circuit breakers.

## SOFTWARE VERSION 4.02 INSTALLATION

90. If the NM6000 4.02 installation wizard program was previously run to load the CD-ROM files on to the laptop hard drive, skip to step 91.
    a. Insert the Narkomed 6400 - 4.02 Software CD-ROM into the CD ROM drive of the Laptop.
    b. If the Laptop drive is not set up to auto run, browse the CD using Windows Explorer and double click Set-up.exe.
    c. At the "Welcome to NM6400 Transfer Program" dialog box, click "Next".
    d. At the "Remove Existing Components" dialog box, uncheck the desired software, if any, then click "Next".
    e. At the "Select Component" dialog box, select "NM6400 Version 4.02" and click "Next" to begin loading the program onto the laptop.
    f. At the "Transfer Results" dialog box, verify the NM6400 4.02 files were transferred, then click "Next".
    g. Close any open windows then turn off laptop.

91. With the NM6000 System Power switch at STANDBY and the laptop power switched off, connect the one foot long Vitalbus cable P/N 4113989-001 or the six foot long cable P/N 4113989-002 to any Vitalbus port (J4 through J7) on the NM6000. Connect the other end of the cable to the laptop's LAN card as shown in FIGURE 20.

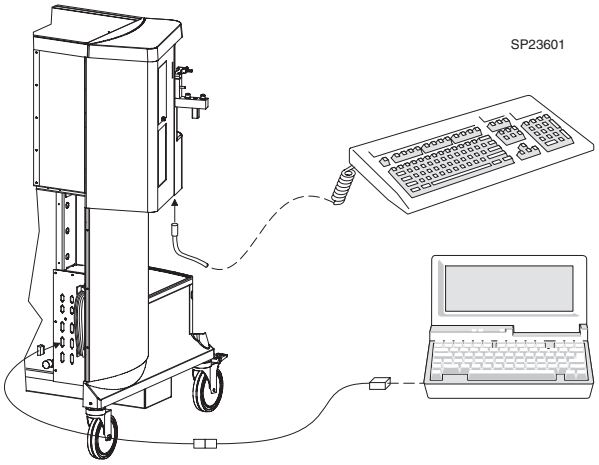


**FIGURE 20. Laptop and Keyboard Connections**

**CAUTION:** Before connecting an external computer to the Narkomed 6000 series machine, verify the computer is running a virus protection application that is set to scan all files and is enabled. You must also verify that the scan engines and definition files are of current vintage.

92. This procedure assumes that the laptop has been properly configured to share files with the host NM6400. If uncertain, perform an Event Log Transfer now and reconfigure the laptop as required. Refer to Narkomed 6000 Series Technical Service Manual, Sections 2.8 through 2.10.
93. With the NM6000 System Power switch at STANDBY, connect a keyboard, P/N 4115133, to the DIN connector on the underside of the NM6000 cockpit area. See FIGURE 20.
94. Power on the Narkomed 6000 series machine and press the Divan Standby key to abort the selftest. Wait for the Narkomed 6000 series machine to complete startup.
95. At the blue Windows NT – Service pack 5 screen, verify the proper amount of RAM memory is present. Refer to the RAM requirements identified in FIGURE 10.
96. Power up the laptop.

**NOTE:** If using a Windows NT or WIndows XP laptop, you must press Ctrl+Alt+Delete to log on and add your unique number to the 'Computer Name'; i.e. 'SRVLAP042' or 'L22345'.

**NOTE:** If your password, computer name or domain was changed, contact your administrator to obtain this information.

**INSTALLATION PROCEDURE (continued)**

97. On the keyboard connected to the Narkomed 6000 series machine, press the ESC key several times.

    **NOTE:** The next sequence of steps must be performed quickly and in this exact order:

    - Press and hold the CTRL key, press and hold the F9 key, release the CTRL key, release the F9 key.
    - Press and hold the ALT key, press and hold the F9 key, release the ALT key, release the F9 key.

    **NOTE:** If you are not able to perform the next step, you may need to repeat the previous step several times to disable the keyboard filter. While the filter is active, no keystrokes are passed on to any application or the operating system. The following steps will not work if you are NOT successful in disabling the keyboard filter. THERE WILL BE NO PHYSICAL INDICATIONS THAT THE FILTER HAS BEEN DISABLED.

98. On the keyboard connected to the Narkomed 6000 series machine, press the Windows key or CTRL+ESC keys to bring up the Start menu. Select 'Settings->Control Panel' from the task bar.

    **NOTE:** When navigating using the touch screen, use a narrow, blunt object for making selections. When an item is selected it will be highlighted and a dotted line will appear around the text.

99. On the Control Panel dialog box, select the 'ELO Touchscreen' icon, then press Enter. See FIGURE 21.

**FIGURE 21. Control Panel**

**NOTE:** If there are multiple ELO Touchscreen listings, select the first entry.

100. On the ELO Touchscreen dialog box, press the 'Calibrate' button. See FIGURE 22.

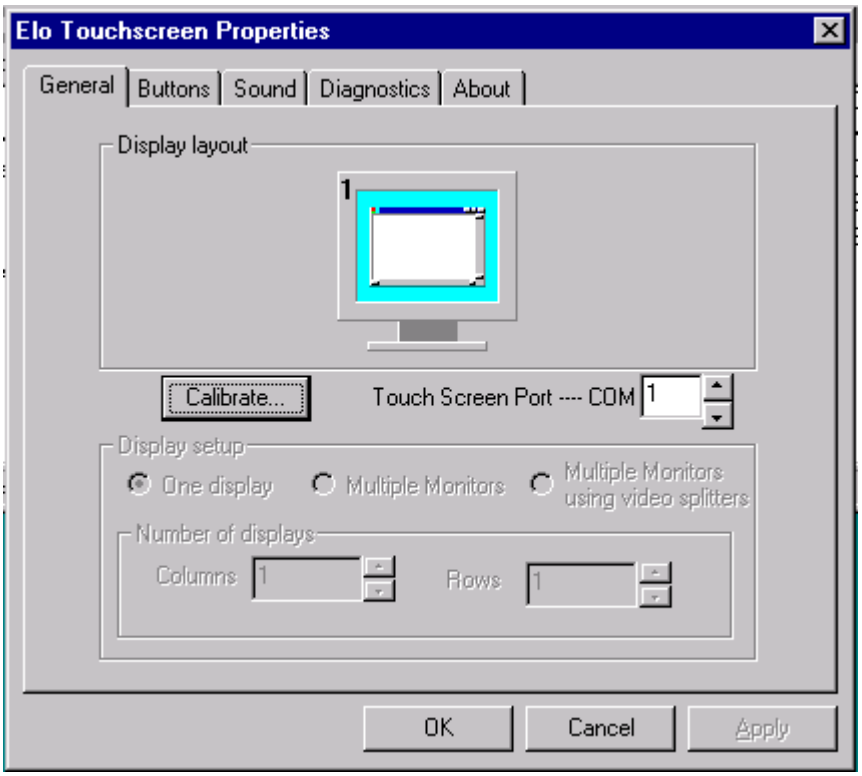


**FIGURE 22. Touchscreen Properties**

101. Touch the screen at the specified three locations. Verify that the touchscreen is calibrated by touching at different locations. Verify that you can position the cursor accurately in all four corners.
102. Select the Sound tab and verify 'Enable Click Sounds' is not selected and press OK. If 'Enable Click Sounds' is selected, deselect it, then press OK. Touch the 'X' to close the control panel dialog box.
103. Press Ctrl+Alt+Delete to display the Windows NT Security dialog box as shown in FIGURE 23.

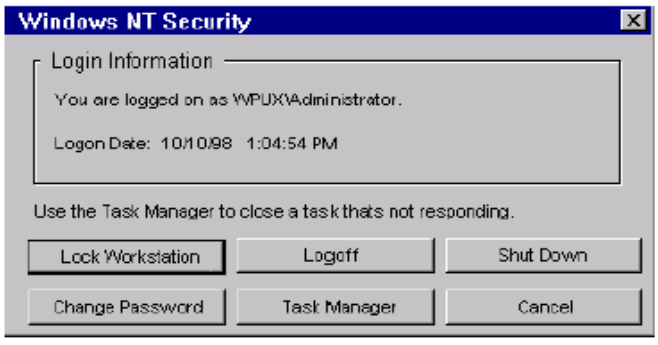


**FIGURE 23. Windows NT Security**

**INSTALLATION PROCEDURE (continued)**

104. Touch the 'Task Manager' button to launch the Windows NT Task Manager dialog box.
105. Touch the 'Applications' tab.

    **NOTE:** If no tabs are visible on the Task Manager window, the current view is collapsed. To see an expanded view, touch the Task Manager box near the middle, along the right edge of it's frame.

106. Using the cursor, select the 'SYSTEM 1 MANAGER' application by touching the corresponding icon.. Touch the 'End Task' button. See FIGURE 24.

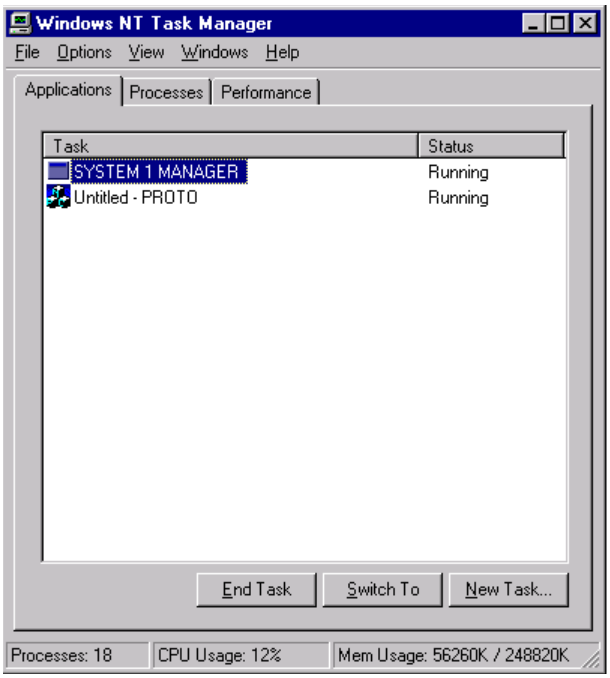


**FIGURE 24. Application System 1 Manager**

107. Touch the 'Processes' tab. Touch the screen at the 'gsplus.exe' file. Touch the 'End Process' button FIGURE 25. Touch 'Yes' in the Task Manager Warning dialog to end the task. See FIGURE 26.

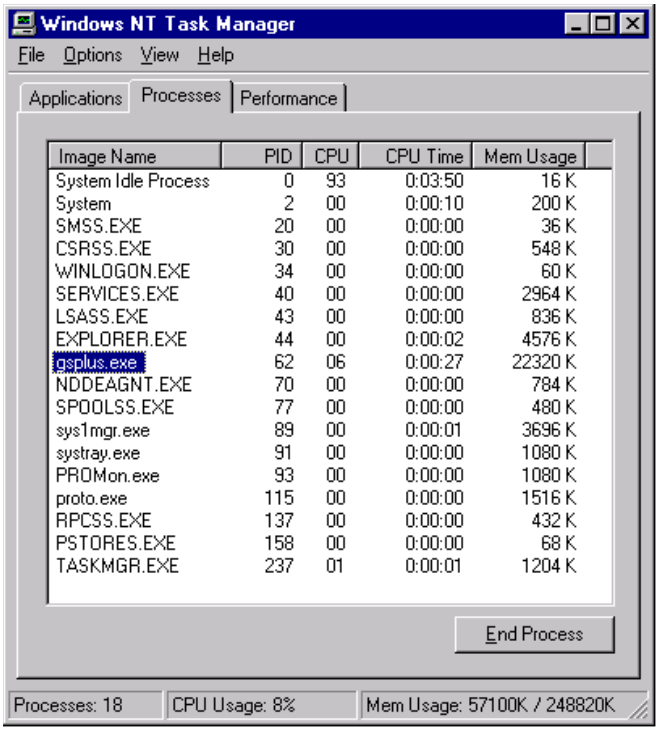
Windows NT Task Manager
File Options View Help
Applications Processes Performance
Image Name PID CPU CPU Time Mem Usage
System Idle Process 0 93 0:03:50 16 K
System 2 00 0:00:10 200 K
SMSS.EXE 20 00 0:00:00 36 K
CSRSS.EXE 30 00 0:00:00 548 K
WINLOGON.EXE 34 00 0:00:00 60 K
SERVICES.EXE 40 00 0:00:00 2964 K
LSASS.EXE 43 00 0:00:00 836 K
EXPLORER.EXE 44 00 0:00:02 4576 K
gsplus.exe 62 06 0:00:27 22320 K
NDDEAGNT.EXE 70 00 0:00:00 784 K
SPOOLSS.EXE 77 00 0:00:00 480 K
sys1mgr.exe 89 00 0:00:01 3696 K
systray.exe 91 00 0:00:00 1080 K
PROMon.exe 93 00 0:00:00 1080 K
proto.exe 115 00 0:00:00 1516 K
RPCSS.EXE 137 00 0:00:00 432 K
PSTORES.EXE 158 00 0:00:00 68 K
TASKMGR.EXE 237 01 0:00:01 1204 K
End Process
Processes: 18
CPU Usage: 8%
Mem Usage: 57100K / 248820K

**FIGURE 25. Processes GSPlus.exe**

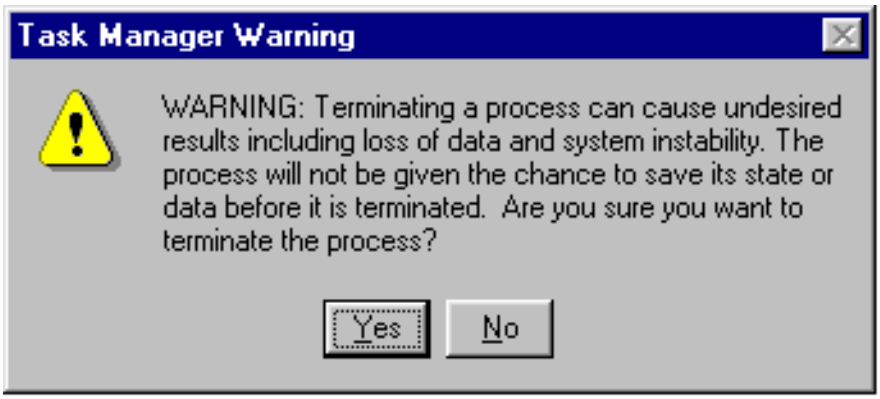
Task Manager Warning
WARNING: Terminating a process can cause undesired results including loss of data and system instability. The process will not be given the chance to save its state or data before it is terminated. Are you sure you want to terminate the process?
Yes
No

**FIGURE 26. Task Manager Warning**

108. On the keyboard connected to the Narkomed 6000 series machine, type ‘Alt+F4’ to close the Windows NT Task Manager.
109. On the keyboard connected to the Narkomed 6000 series machine, press the Windows key or ‘Ctrl+Esc’ then select ‘Programs->Windows NT Explorer’ from the task bar. From the menu list at the top of the Explorer window, select ‘Tools’, ‘Map Network Drive...’ then press Enter. Refer to FIGURE 27.

**INSTALLATION PROCEDURE (continued)**

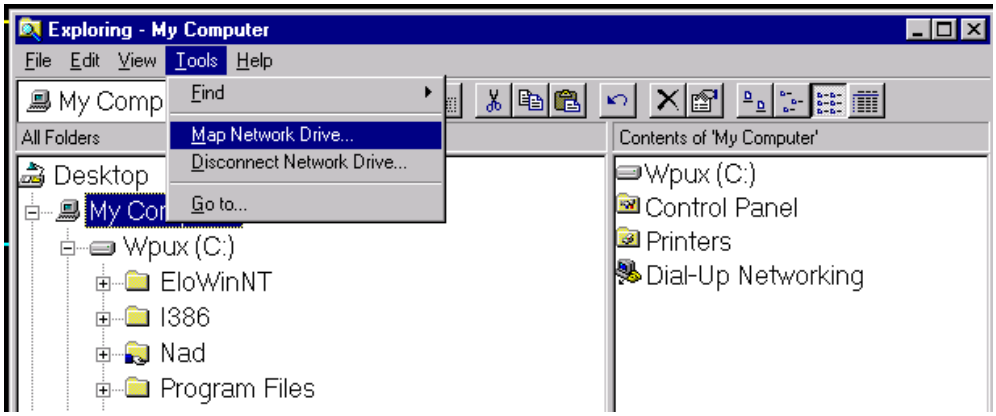


**FIGURE 27. Exploring: Map Network**

110. On the Touchscreen select the 'Drive:' dropdown arrow and select the 'E:' drive. Touch the 'Path' dropdown arrow and select the '\\srvlap\NAD Software' path if using Windows 95, Windows 98 or Windows ME. See FIGURE 28. If using Windows NT or Windows XP, you must use your unique computer name in the field path, i.e '\\srvlap042\NAD Software', or '\\L98474\NAD Software'. If your required path is not included in the dropdown list, touch the 'Path' field to move the cursor, then use the keyboard connected to the Narkomed 6000 series machine to enter this information.

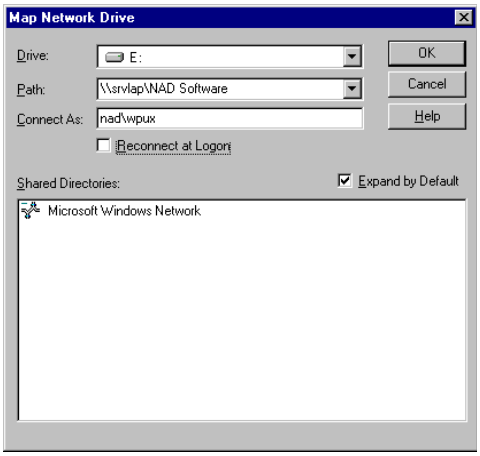


**FIGURE 28. Map Network Drive Dialog Box**

111. Touch the 'Connect As' field to move the cursor to the 'Connect As' field. Then use the keyboard connected to the NM6000 to enter 'wpux'.
112. Ensure that the 'Reconnect at Login' check box is not selected. Click OK.

113. If you are not using a Windows NT laptop, skip to the next step, otherwise 'Enter Network Password' dialog box, remove the text from the 'Connect As:' field and type in your computer name; i.e. 'srvlap035'. In the 'Password' field, enter 'password' as the password. Click OK. See FIGURE 29.

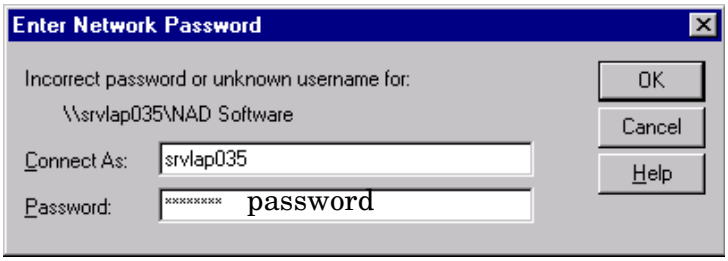


**FIGURE 29. Typical NT Network Password Dialog Box**

114. Using the keyboard connected to the Narkomed 6000 series machine, press F5 to refresh the display.
115. Select 'NAD Software on srvlap (E:)'. See FIGURE 30.

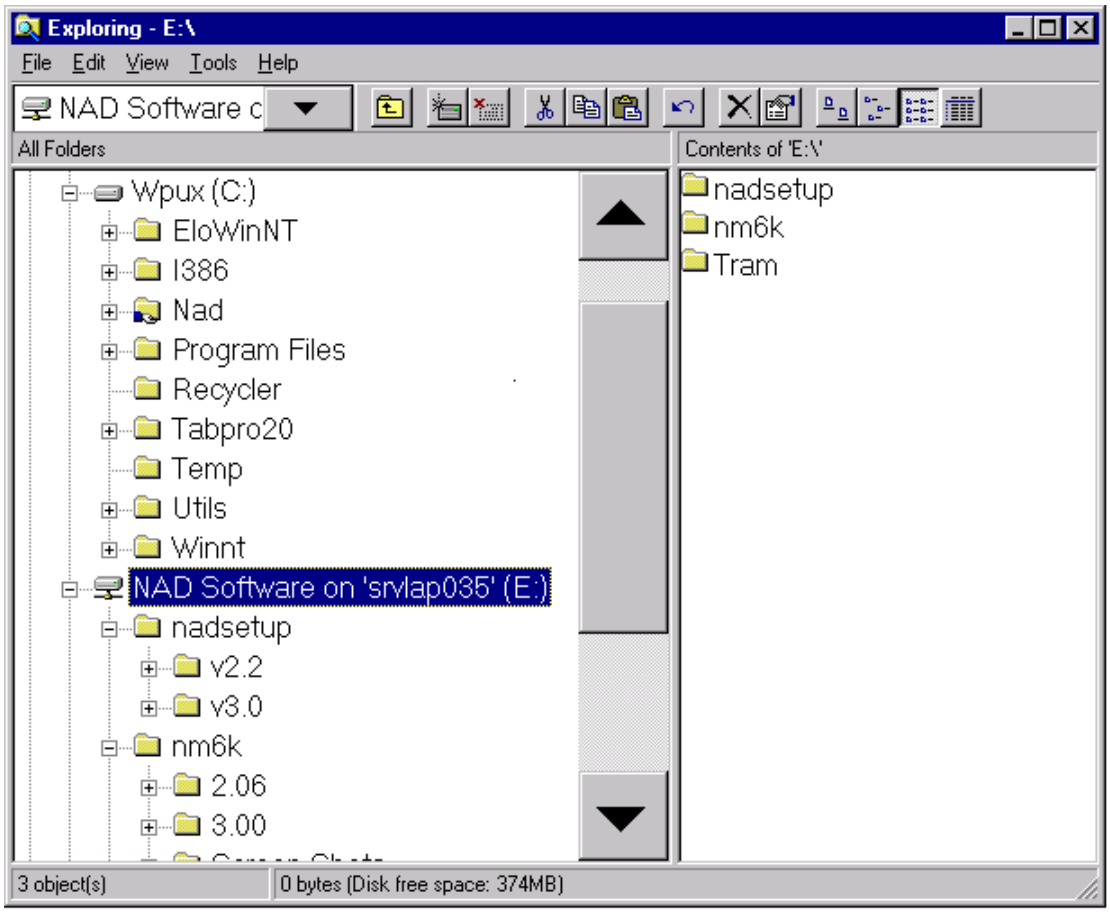


**FIGURE 30. Typical Software Dialog Box**

**INSTALLATION PROCEDURE (continued)**

116. Select the 'nadsetup' folder and press Enter. Select 'V4.02' folder and press Enter. Use the arrow key on the keyboard connected to the Narkomed 6000 series machine to select 'Install.bat' file, then press Enter to run the NAD Install program. See FIGURE 31.

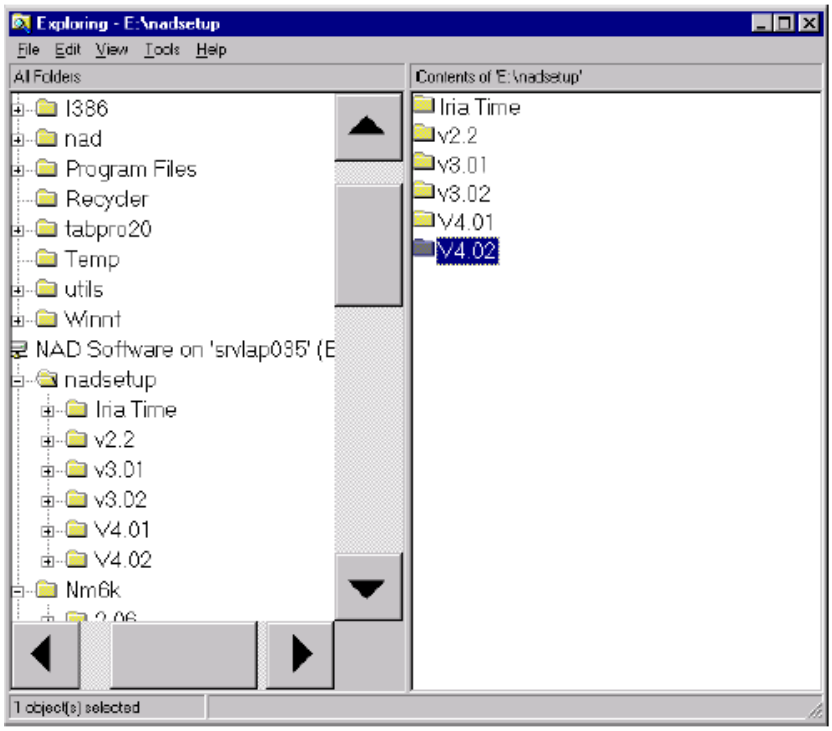


**FIGURE 31. V4.02 Folder**

117. On the 'NAD Installation' dialog box, ensure that 'NM6K' is selected as the program, and click the 'Install' button. See FIGURE 32.

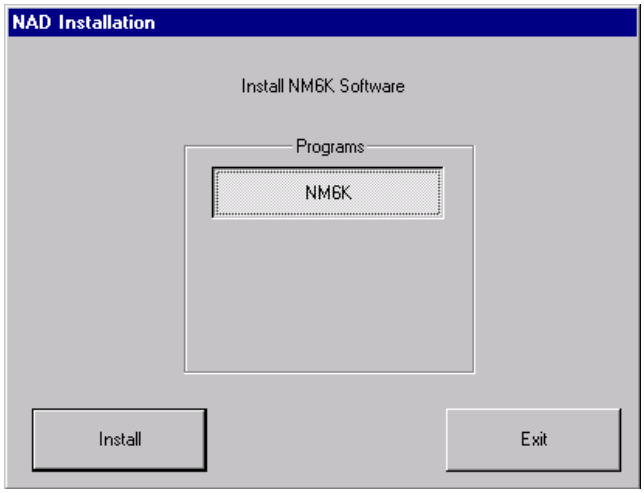


**FIGURE 32. NAD Installation**

118. On the User Data dialog, touch the OK button. See FIGURE 33.

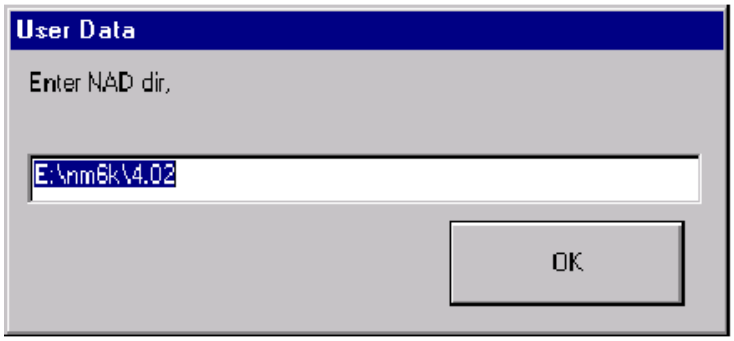


**FIGURE 33. Typical Source Dialog Box**

119. Examine the communication ports on the Vitalbus assembly. If you have four communication ports - COM 5, COM 6, COM 7and COM 8, see FIGURE 34. Touch the 'Yes' button for 'Is isocomm board installed?' in the dialog box shown in FIGURE 35. Select the 'No' button if COM 5, COM 7, AND COM 8 are covered with blank plates.

**CAUTION:** Failure to select the proper communication port(s) configuration will result in a system diagnostic failure at start-up causing the machine's WPU to keep re-booting.

**INSTALLATION PROCEDURE (continued)**

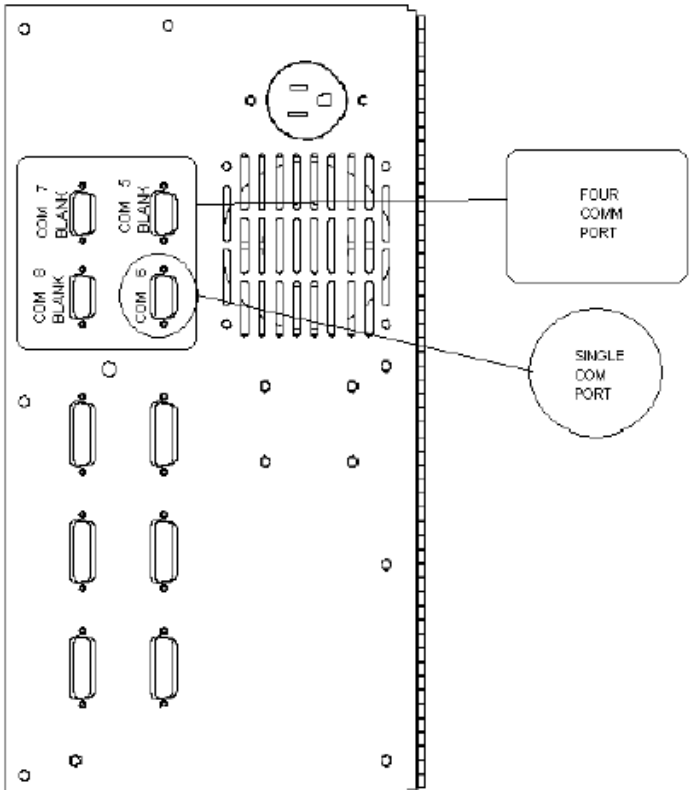


**FIGURE 34. Vitalbus Communications Port Options**

**FIGURE 35. Isocomm Dialog Box**

120. Verify the Nm6kmsg.dll = 0xBA0D, CVP = “1.08 POD IPM” - 0x79E7, SCR = “1.04 POD SCR” - 0x66EC data displayed on the ‘User Info’ dialog box. See FIGURE 36.

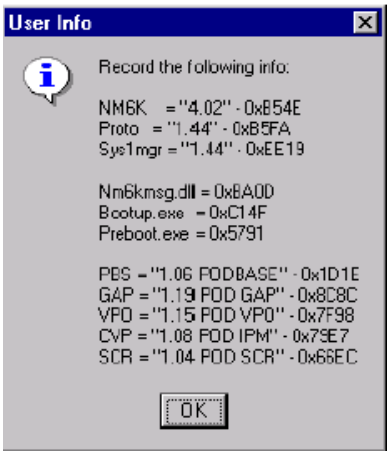
User Info
Record the following info:
NM6K = "4.02" - 0xB54E
Proto = "1.44" - 0xB5FA
Sys1mgr = "1.44" - 0xEE19
Nm6kmsg.dll = 0xBA0D
Bootup.exe = 0xC14F
Preboot.exe = 0x5791
PBS = "1.06 PODBASE" - 0x1D1E
GAP = "1.19 POD GAP" - 0x8C8C
VPO = "1.15 POD VPO" - 0x7F98
CVP = "1.08 POD IPM" - 0x79E7
SCR = "1.04 POD SCR" - 0x66EC
OK

**FIGURE 36. 4.02 Version and CRC Values**

121. Refer to the WPU serial number recorded previously. If its correct, touch the ‘OK’ button to continue. If the serial number is incorrect, touch the ‘WPU Serial Number’ field. Using the keyboard attached to the Narkomed 6000 series machine, type in the serial number previously recorded. Touch the ‘OK’ button to continue. See FIGURE 37.

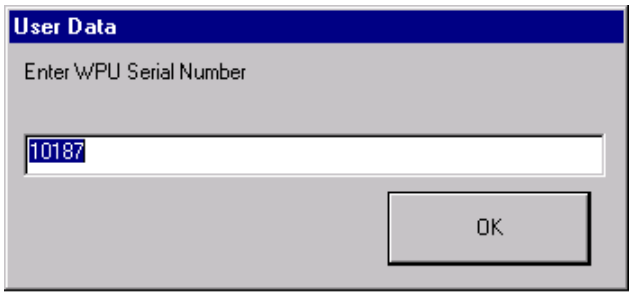


**FIGURE 37. Typical Serial Number Dialog Box**

122. Touch the 'OK' button for the Registry Editor dialog box. See FIGURE 38.

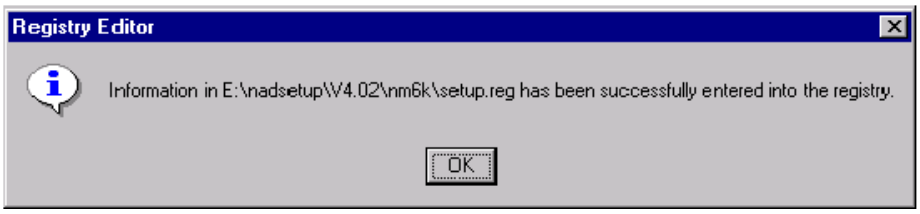


**FIGURE 38. Registry Editor Dialog Box**

123. Touch the 'OK' button on the 'Installation Completed' dialog. See FIGURE 39.

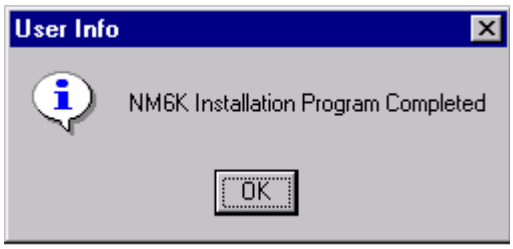


**FIGURE 39. Reboot Machine Dialog Box**

124. The machine will reboot at this time. It could take several minutes to complete. After the machine reboots, sys1mgr will automatically start.

**NOTE:** If there are new pod images, the images will be loaded to the pods upon the first startup. This process is automatic and upon its completion, the system self diagnostic tests will continue.

**CAUTION:** Failure to select the proper communication port(s) configuration will result in system diagnostic failure at start-up causing the machines WPU to keep re-booting. To recover from this error should it occur, you must perform the following. Step 2 should be started as soon as you see the Windows Start key displayed on the monitor and step 3 must be completed before the self-diagnostic system status dialog is displayed. on the monitor. Repeat steps 1 - 3 if system continues to reboot.

1. Initiate a system reboot by pressing the SYSTEM CONDITIONALLY FUNCTION button.

2. Wait until you see the Windows Start key appear then unlock the keyboard connected to the Narkomed 6000 series machine by performing step 97.
3. Shut down the SYSTEM 1 MANAGER and gsplus.exe by performing steps 103 - 108.
4. Proceed with this installation beginning at step 109.

**NOTE:** If you continue to experience a system re-boot situation, physically examine the WPU for the proper number of COM ports, then make the appropriate selection.

125. Access the Primary Service screen. (Refer to Accessing the Service Screens in Section 2.1 of the Narkomed 6000 Series Technical Service Manual.)
126. Access the Advance Service Mode. (Refer to Accessing the Service Screens in Section 2.2 of the Narkomed 6000 Series Technical Service Manual.)
127. Select the Service Monitors key. Select the Gas Flow tab. Follow the Fresh Flow Notebook calibration instructions. See FIGURE 40.

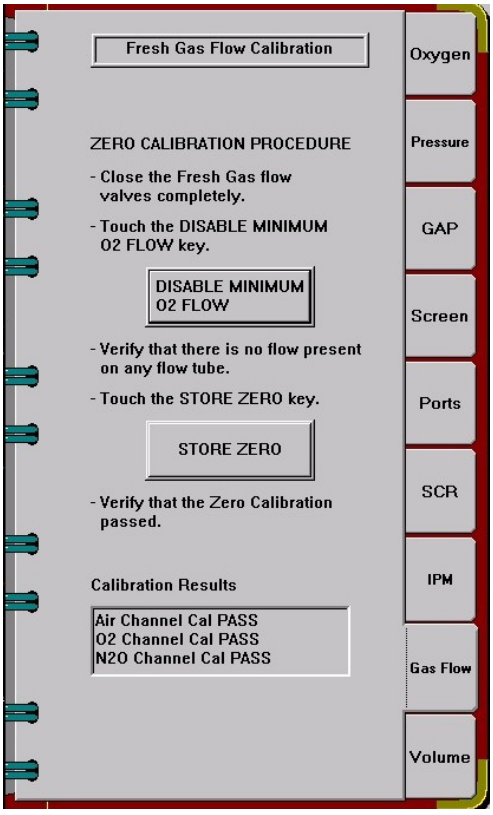


**FIGURE 40. Fresh Gas Flow Calibration**

**INSTALLATION PROCEDURE (continued)**

128. Select the 'Service Config' key. Select the Options tab in the NM6400 CONFIGURATION notebook to access the OPTIONS page. If the machine requires the activation or reactivation of an Audible O2 Whistle or *Air Only Mode optional feature, touch the correct key to toggle the corresponding option to Installed.

    *Denotes a feature that requires a Software Option Keylok attached to the WPU parallel port for its activation.

    **NOTE:** The Low Flow Wizard is enabled by default. If its deactivation is desired, toggle its setting to 'Not Installed.'

129. Touch the Update tab in the NM6000 CONFIGURATION to access the UPDATE page. (Refer to Accessing the Service Screens in Section 2.4.2 of the Narkomed 6000 Series Technical Service Manual.) If any PBS versions are displayed in red boxes, (see FIGURE 41. ), touch the corresponding area on the screen to initiate a PBS update. After all downloads are completed, they will reset and reference the latest pod-based software versions. Before cycling power, verify all pod base software versions are 1.06 and CRC value 1D1E. If any PBS versions were updated, turn the System Power switch to Standby, wait until the Divan display blanks, then turn the System Power switch to On. Go back to this notebook and verify they display the proper values.

    **NOTE:** POD Communication will be lost during this update. This is normal and communication will be reestablished after cycling power.

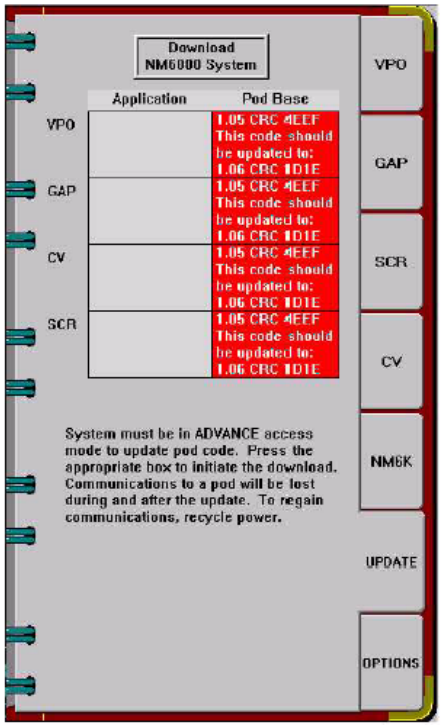
Download NM6000 System
Application
Pod Base
VPO
GAP
CV
SCR
1.05 CRC 4EEF This code should be updated to: 1.06 CRC 1D1E
System must be in ADVANCE access mode to update pod code. Press the appropriate box to initiate the download. Communications to a pod will be lost during and after the update. To regain communications, recycle power.
VPO
GAP
SCR
CV
NM6K
UPDATE
OPTIONS

**FIGURE 41. Pod Based Software**

130. Verify 'Air Only Mode', 'O2 Supply Whistle', and Low Flow Wizard software options if required, are installed and functional.
131. Press the Exit Service key. At the Service Mode dialog box, press the Revision #s key to call up the Revision List dialog box. Use the scroll bar to navigate through the list and verify that each of the items identified in FIGURE 42. are at the proper CRC and version.

| Name | CRC | Version |
|---|---|---|
| BOOTUP | c14f | 1.44 |
| PREBOOT | 5791 | 1.44 |
| PROTO | b5fa | 1.44 |
| SYSTEM1MGR | ee19 | 1.44 |

**FIGURE 42. Service Mode Revision #S**

132. Press the 'OK' key to close the Revision List dialog box. Press the 'OK' key to close the Service Mode dialog box.
133. Press the 'To Primary Keys' button then press the 'Setup Notebook' button. Select the 'About' tab to call up the About System Software dialog box. Verify that all items identified in FIGURE 43. are at the proper CRC and version.

| Name | Version | CRC |
|---|---|---|
| NM6400 | 4.02 | B54E |
| Volume Pressure Oxygen | 1.15 | 7F98 |
| Gas Analysis | 1.19 | 8C8C |
| Integrated Patient Monitor, (if installed) | 1.08 | 79E7 |
| Strip Chart Recorder, (if installed) | 1.04 | 66EC |

**FIGURE 43. About System Software Revisions**

134. Attach the SW 4.02 label above the serial number label at the back of the machine. See FIGURE 44. for proper location.

**INSTALLATION PROCEDURE (continued)**

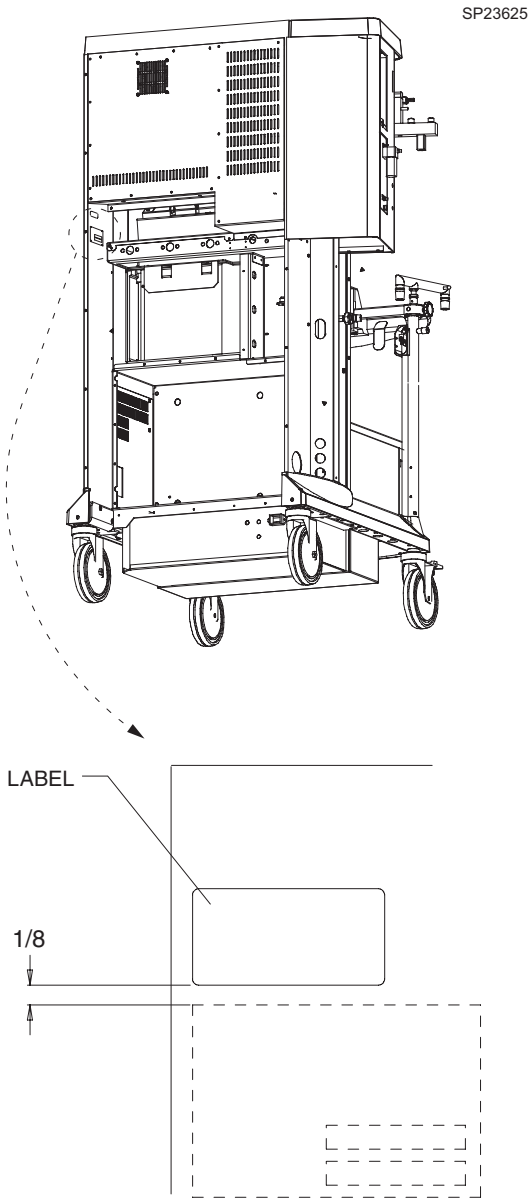


**FIGURE 44. 4.02 Label Installation**

135. Locate the Operator's Instruction 3-ring binder assembly. Locate and discard the Narkomed 6000 Anesthesia Machine Operator's manual and replace it with a Narkomed 6400 Anesthesia Machine Operator's manual. Locate and discard the Quick Reference Guide and Troubleshooting Guide and replace them with the updated versions. If the machine is fitted with an IPM pod, locate and discard the Integrated Patient Monitor Option for the Narkomed 6000 Anesthesia Machine manual and replace it with Integrated Patient Monitor Option for the Narkomed 6400 Anesthesia Machine manual.
136. Place the 4.02 Users Guide on the machine table top.
137. Place the spare Waterlock Pot in the machine drawer.
138. Perform a periodic manufacturer's Certification on this machine. Refer to Section 6 of the Narkomed 6000 Series Technical Service Manual. If applicable, also perform the IPM test procedure given in Section 6A of the Narkomed 6000 Series Technical Service Manual.

# APPENDIX A

Appendix A of this Service Procedure is provided for your convenience. The following table is a matrix representing all parts contained within each kit. This matrix details quantity, piece part number, and associated kit applicability defined by Usable On Code (UOC). Also contained on the matrix is a cross reference between part number and item number as found on the figures within this Service Procedure.

The following is a definition of each UOC:

UOC A - Items contained in Kit Number 4118146
UOC B - Items contained in Kit Number 4118147
UOC C - Items contained in Kit Number 4118148
UOC D - Items contained in Kit Numbers 4118146, 4118147, and 4118148

## Appendix A

| PART NO. | DESCRIPTION | QUANTITY/ UNIT OF MEASURE | UOC | ITEM NO. (If Applicable) |
|---|---|---|---|---|
| 4118094 | UPGRADE-SENSOR COVER-NM6000 | 1 EA | D | 55 |
| 4117955 | COVER-SHIELD-PCB-NM6400 | 1 EA | A,B | 49 |
| 4118093 | BRACKET-SENSOR COVER-NM6400 | 1 EA | D | 59 |
| HW66006 | WASHER-FLAT #6 SS | 1 EA | D | 60 |
| HW55003 | NUT-KEP 6-32 ST STL | 2 EA | D | 61 |
| HW67007 | WASHER-LOCK INT-T #6 SS | 2 EA | D | 57 |
| HW19005 | SCR-PAN HD PHL 6-32X1/4 LG SS | 2 EA | D | 56 |
| HW01014 | SCR-CAP SKT HD 8-32X1/2L SS | 1 EA | D | 62 |
| 4118618 | TUBE ASSEMBLY | 1 EA | D | 39 |
| 4118619 | TUBE ASSEMBLY | 1 EA | D | 41 |
| 4117968 | CABLE ASM-EFG MEASURE-NM6400 | 1 EA | D | 63 |
| 4115988-001 | PCB-DRAM-PC100-64MEG | 1 EA | A | N/A |
| 4115420-006 | CD-ROM NM6400 SOFTWARE-V4.02 | 1 EA | D | N/A |
| 4113065-001 | CABLE ASM-VITALBUS 5 FT | 1 EA | D | N/A |
| SE4117925 | SE-GAS ANALYZER POD 2 ASM | 1 EA | D | N/A |
| 4117965-002 | INSTR MAN-NM6400 | 1 EA | D | N/A |
| 4118451 | LABEL-SW4.02-NM6400 SERIES | 1 EA | D | N/A |
| 4118150 | LABEL-WPU RAM UPGRADE-128MB | 1 EA | A,B | N/A |
| 4116920-008 | KEYLOK ASM-T/S/TREND-4.0 | 1 EA | D | N/A |
| 4114575-001 | MONITOR SHELF-TOP-NM6400 | 1 EA | D | 1 |
| 4117966-002 | INSTR MAN-IPM OPTION-NM6400 | 1 EA | A,B | N/A |

## Appendix A

| PART NO. | DESCRIPTION | QUANTITY/ UNIT OF MEASURE | UOC | ITEM NO. (If Applicable) |
|---|---|---|---|---|
| 4109371 | LABEL-TIPOVER HAZARD | 1 EA | D | 2 |
| SP00259 | CONVERSION KIT, NM6000 TO NM6400 | 1 EA | D | N/A |
| PL00050 | QUICK REFERENCE GUIDE | 1 EA | D | N/A |
| 4115159 | TROUBLESHOOTING GUIDE | 1 EA | D | N/A |
| 4118235 | USERS GUIDE 4.01 | 1 EA | D | N/A |
| 4118128 | WATERLOCK M POT - DW WATER-LOCK | 1 EA | D | N/A |
| 4180103 | PVC SAMPLE LINE, 96” | 1 EA | D | N/A |
| 4115961 | SEMI-PERM TUBE w/LABEL | 1 EA | D | N/A |
| 4114185-001 | PCB-DRAM-32MB | 4 EA | B | N/A |
| 4114185-001 | PCB-DRAM-32MB | 2 EA | C | N/A |
| 4117629 | LABEL WPU RAM UPGRADE-64 MB | 1 EA | C | N/A |
| 4118621 | RELIEF VALVE ASM | 1 EA | D | (A) |
| 4118617 | FRESH GAS FLOW BOX ASM | 1 EA | D | 42 |
| 4118622 | LABEL, WPU PROCESSOR - 233 MHZ UPGRADE | 1 EA | C | N/A |
| 4114184-001 | IC, PROCESSOR, PENTIUM 233 MHZ | 1 EA | C | N/A |
| 4118249 | HEAT SINK COMPOUND | 1 EA | C | N/A |
| 4118620 | TOP FLOWMETER ASM | 1 EA | B,C | N/A |

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